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Healthcare Monitoring System Using IoT

Nishant Kulkarni[1], Prasad Ransing[2], Sujay Patil[3], Sarwarth Pawase[4], Pratik Shinde[5], Shreyash Pawar[6], Sanket Patil[7]
[1]*Assistant Professor, Mechanical Department, Vishwakarma Institute of Technology Pune, India*
[2, 3, 4, 5, 6, 7]*Mechanical Department, Vishwakarma Institute of Technology Pune, India*

Abstract: ***Today, the Internet of Things (IoT) is playing important role in health sector for the development of India. It has many applications in the medical field. Due to the increase of many diseases, problems related to human health are raised. The population is also increasing day by day. Therefore, it is not possible to get a treatment that is right for each person anytime soon. Internet of Things offers a lot of sensors for temperature checking. In this project, we made patient monitoring system using IoT that is easy to handle and less cost. The sensor used are LM35 temperature and pulse rate sensor for measuring body temperature and pulse rate. The pulse sensor gives digital output by placing finger on it. These sensors are connected to the Arduino UNO. IoT Health Monitoring System is an atomization system that is use for measuring body temperature and pulse rate.***

Keywords: ESP8266 WIFI module, Internet of goods, Arduino

I. INTRODUCTION

Healthy vegetables and fruits make human life healthy. This project also aims to control combined health conditions similar to heart-related conditions in this project. Exploration IOT's resting health monitoring system is designed to cover cardiac exertion using a thrill detector, to cover a person's heart rate using a heart rate monitor, and to cover body temperature using the temperature sensor. Health monitoring systems could prove to be even more beneficial for populations that live far from the ocean and live in towns. These people did not make it to the sanatorium in time to save the case. IOT health monitoring system corresponds to different modules similar to temperature detector, heart rate monitor, electrocardiogram graph, Global System for Mobile communication module, LM35 module and the Arduino UNO. LM35 temperature sensor is used in this project. The temperature range of this sensor to operate over the −55°C to 150°C. This temperature sensor has 3 pins. These pins are voltage, output (OUT), ground (GND). The temperature sensor LM35 connected to Arduino. It is used to measure the temperature of human body. The programmed written in Arduino gives temperature range of LM35 temperature sensor. Its accuracy is more than the thermistor and does not require any external calibration. It gives an analog signal. Another sensor used in this project is pulse sensor. It gives digital output. It includes 24 inches color code. On this sensor, heart beat detecting and biometric pulse rate sensor is present. It is a plug and play type sensor. It required 5V. It has circuits like Amplification and Noise cancellation.

Internet of Goods is a technology model that can be integrated into a real-time business coverage system. The review and implementation of real-time case monitoring using biomedical sensors and microcontrollers is presented when measuring temperature of body and pulse rate. This IoT prototype can read heart rate and measure body temperature and upscale them to the top of goods on the IoT platform.

II. COMPONENTS

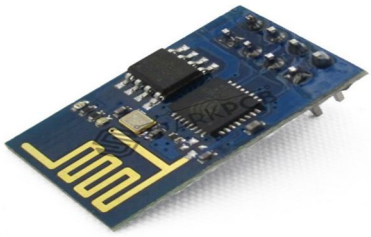
1) Arduino Board



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The Arduino Uno is an electronics platform. It is an open source based on hardware and software. It is based on ATmega328P which is low power consumption microcontroller. It is 8-bit AVR. It has digital and input pins. It reads input light on a sensor and turn it into an output of turning on an LED. The instructions to this board can be sent by writing a code in Arduino board. It is inexpensive and cross platform. It is simple and clear programming environment. It has 6 analog pin inputs, 14 digital pins, a USB connector, a power jack and In-Circuit Serial Programming header.

2) ESP8266



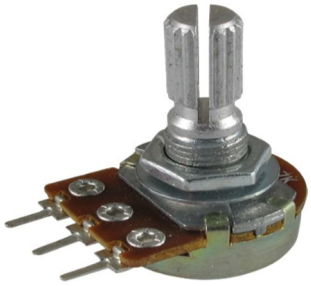
This is a ESP8266 Wi-Fi module which sends measured data to the ThingSpeak IoT sever.

3) LCD Display



This is 16x2 LCD which display 16 characters per line and it has 2 lines. It is used to display temperature and pulse rate.

4) Potentiometer



It is used to implement a variable voltage. It is also providing a voltage at pin 3 that is used to adjust the contrast of LCD. When it provides 0.4V, LCD functions very well and does not give error on LCD screen.

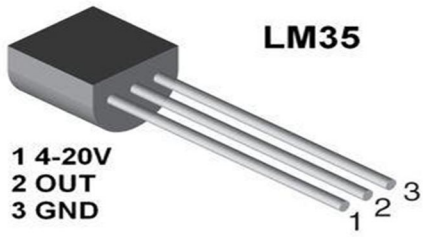
5) Pulse Sensor



The Pulse sensor is used to measure the pulse rate and it gives digital output.

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6) Temperature Sensor



This the LM35 temperature sensor which is used to measure the temperature of human body. It has 3 pins. They are voltage(V), output (OUT) and ground (GND) respectively. The range of this sensor is from −55°C to 150°C.

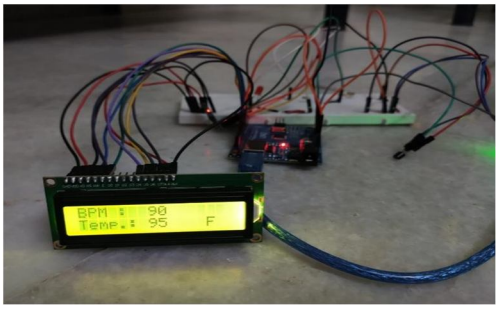
7) Resistor



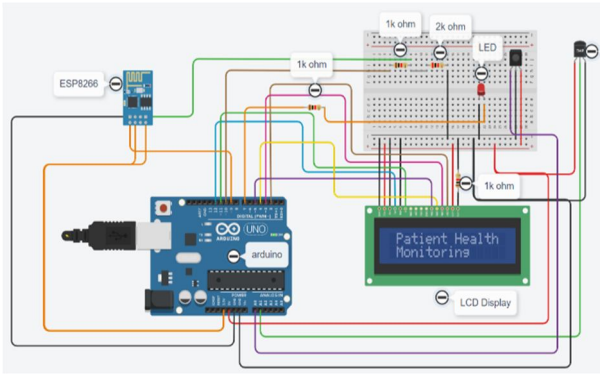
A 1k ohm and a 2k ohm resistor is used in this project to adjust current as well as voltage.

A. After Everything is Assembled

This is the actual model made after doing proper connections.



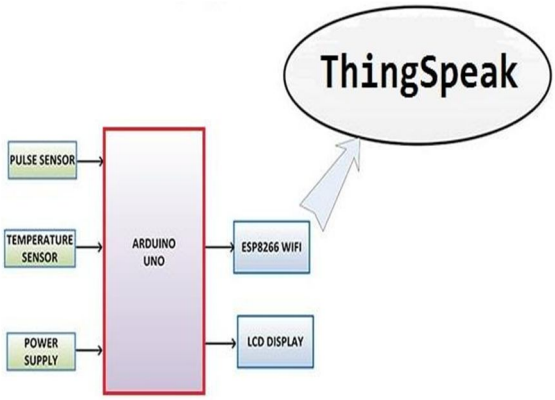
B. Circuit Diagram



This is the TinkerCad circuit diagram of our project which describing all sensors and connections.

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III. BLOCK DIAGRAM



This is the actual block diagram describing our working of project. The pulse sensor is connected to Arduino which measure the pulse rate of human body in BPM. The temperature sensor LM35 is connected to the Arduino which measures the human body temperature. Power supply is given to the Arduino. To transfer measured data to ThingSpeak which is a IoT server, The module used is ESP8266 Wi-Fi module. Also the connection of LCD display to see the measured data. The programme is written in the Arduino.

IV. LITERATURE REVIEW

Internet of Things (IoT) plays an import role in the field of medical. It develops medical field very rapidly because of many sensors and IoT healthcare devices. Doctors can see the blood and pulse rate checkup data very easily and at any time. Patients can regular check temperature of body and pulse rate easily and at any time.

From reference paper [1] gives proposed system which consists of various medical devices like IoT sensors and mobile based applications which communicate through network connected devices and helps to monitor and record patient's health data and medical information. It builds a system to provide medical aid for the patients where hospital is not present in the area. Patients can check their health status from any place at any time.

From reference paper [2] gives proposed system which can monitor the patient's body condition at any place. It measures body temperature, pulse rate, humidity and body movements. It stores data on the cloud and this data can check at any time. It measures data at normal situation to track abnormal parameters. It also provides message alert pass function to registered user very easily and securely.

From reference paper [3] gives proposed a remote health monitoring system using IoT where authorized personal can access the data stored using any IoT platform. From measured data, doctors can diagnose the diseases from a distance at any time.

V. APPLICATIONS

1) The users can measure temperature and oxygen level very easily.
2) IoT technology used to detect diseases as early as possible.
3) It is used to track real time locations of medical devices.
4) It is used to obtained Electrocardiogram very easily.
5) It is also used to see measured data from login on ThingSpeak server.

VI. CONCLUSION

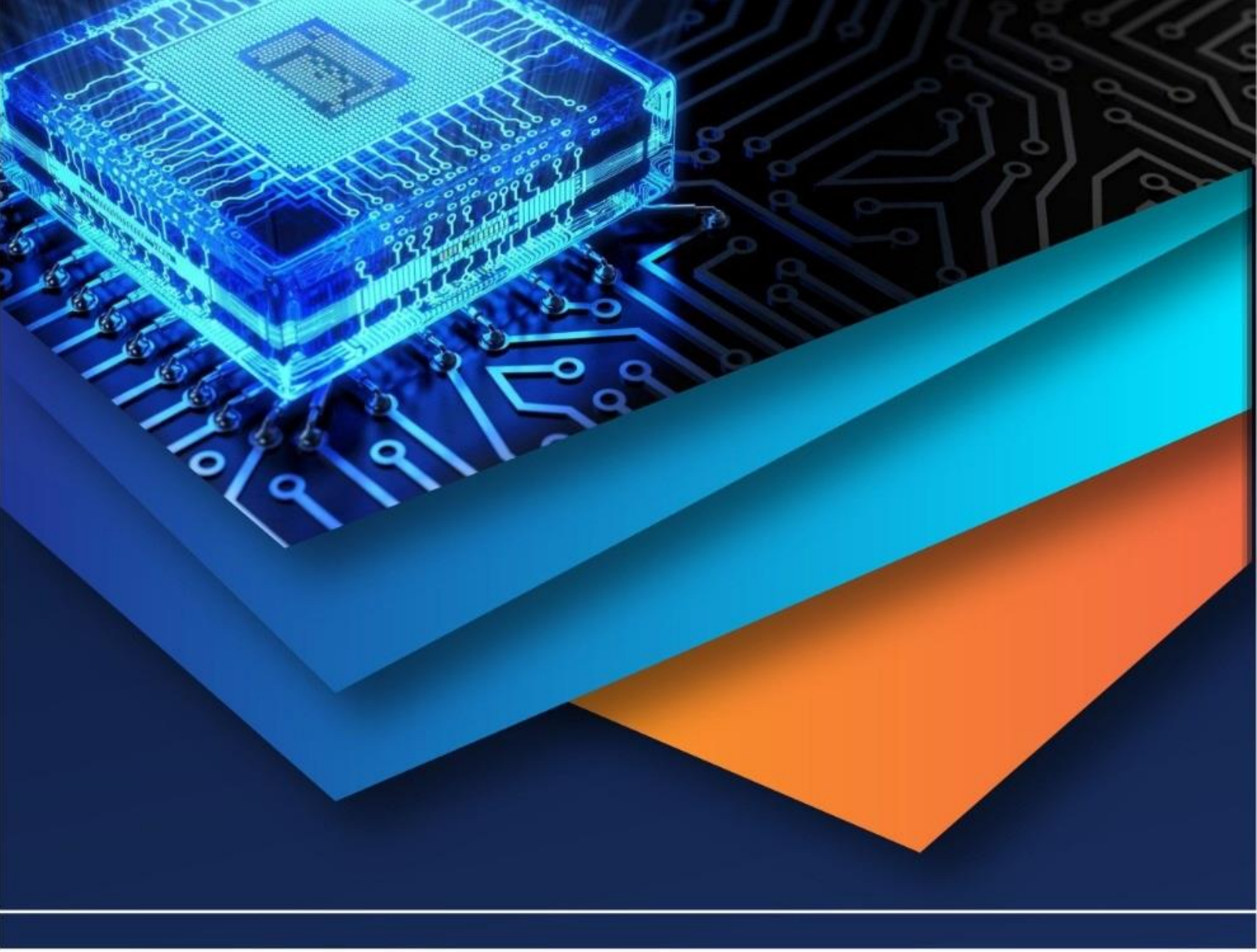
The Internet of Things (IoT) technology is used in this project. From this project, we detect human body temperature. We also measure pulse rate of human by using pulse sensor.

By using ThingSpeak, the Internet of Things server, the temperature and pulse rate measure from temperature sensor and pulse rate sensor is 95 °F and 90 BPM respectively sent to ThingSpeak server with the help of ESP8266 Wi-Fi module. By login on server, we see data from any location.

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