



IOT BASED HEALTH MONITORING SYSTEM

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ABSTRACT

The proposed project can collect and send patient's health data to an IoT cloud server such as Thingspeak where real time health status of the patient can be recorded and monitored in a remote location where a healthcare professional is present. This iot based health monitoring system is normally used to collect temperature pressure level etc and keeps monitoring each and every hour.

INTRODUCTION

IoT is a technological standard and heavily researched field at present where sensors are used anywhere at this present time. At present with the revolution of information and technology smart phone based health monitoring system are becoming more popular these days. Here the combination of IoT and Arduino is a new and better way to introduce the Internet of Things for the purpose of Health Care Monitoring system. The

Arduino Uno Board collects data from sensors and transmits wirelessly to the IoT website. The internet of materials used in the care of patients is becoming increasingly common in the field of health, which improve the quality of life of the people. Internet of Things is defined as the integration of all devices connected to a network, which can be controlled from the web and provide information in real time, allowing communication with the users.

What is IoT based health monitoring system?

IoT based patient health monitoring system is a generic term given to any medical equipment that has internet capability and can measure one or more health data of a patient who is connected to the device such as heartbeat, body temperature, blood pressure, ECG, steps etc. The equipment can record, transmit and alert if there is any abrupt change in the patient's health.

Block Diagram



The proposed design of IoT based health monitoring system is built around Arduino microcontroller which is the brain of the project.



HARDWARE USED

1. Arduino uno



Arduino collects real time health data from pulse sensor which measures heartbeat in minutes or BPM (beats per minute). A digital temperature sensor connected to Arduino measures body temperature of the patient. The arduino is responsible for collecting, displaying and sending the data to ESP8266. The whole circuit can be powered using USB or via “Vin” pin (9V-12V).

2.Generic ESP8266



A generic ESP8266 IoT module is connect to Arduino via UART, it is responsible for connecting the machine to internet and also for sending health data to a IoT server (Thingspeak) for storing and monitoring. This circuit is not only capable of sending patient’s health data to a server.

3.LCD display



A LCD display is provided to see the real time data from the sensors; it is set to show the body temperature and heartbeat in BPM.

4.Pulse sensor



The pulse sensor / heartbeat sensor is an inexpensive analog sensor which can measure reasonably accurate pulse rate of human heart with the help of a microcontroller. A microcontroller like Arduino can be programmed to calculate its analog output to BPM or beats per minute.

It can operate from 3.3V to 5V, but here we are connecting it to 5V supply. It has just 3 pins: Vcc, GND and signal

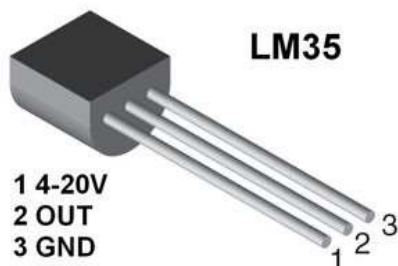


5. Buzzer



We are utilizing a 5V DC buzzer to detect heartbeat rhythm, just like in hospital rooms (or in TV serials/movies) where beep sound emerges when a patient is monitored using ECG / EKG etc. The DC buzzer has polarity, the -Ve of buzzer is connected to GND and +Ve is connected to pin 8 of Arduino. Audio beeps can give a healthcare professional an insight about pulse of a patient, for example, slow pulse indicates that the patient is sleeping or in coma or fast beep indicates that the patient is in some health trouble and need immediate medical attention.

6. LM35 Temperature sensor



The LM35 series are precision integrated-circuit temperature devices with an output voltage linearly-proportional to the Centigrade temperature. The LM35 device has an advantage over linear temperature sensors calibrated in Kelvin, as the user is not required to subtract a large constant voltage from the output to obtain convenient Centigrade scaling. The LM35 device does not require any external calibration or trimming to provide typical accuracies of $\pm 1/4^\circ\text{C}$ at room temperature and $\pm 3/4^\circ\text{C}$ over a full -55°C to 150°C temperature range.

CONCLUSION

The Internet of Things is considered now as one of the feasible solutions for any remote value tracking especially in the field of health monitoring. It facilitates that the individual prosperity parameter data is secured inside the cloud, stays in the hospital are reduced for conventional routine examinations and most important that the health can be monitored and disease diagnosed by any doctor at any distance. In this paper, an IoT based health monitoring system was developed. The system monitored body temperature, pulse rate and room humidity and temperature using sensors, which are also displayed on a LCD. These sensor values are then sent to a medical server using wireless communication. These data are then received in an authorized personal's smart phone with IoT platform. With the values received the doctor then diagnoses the disease and the state of health of the patient.

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