



IJIRCCCE

e-ISSN: 2320-9801 | p-ISSN: 2320-9798



INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

Volume 9, Issue 5, May 2021

ISSN INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA

Impact Factor: 7.488

 9940 572 462

 6381 907 438

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 www.ijirccce.com



IOT Based Patient Health Monitoring System

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ABSTRACT: With tons of new healthcare technology start-ups, IoT is rapidly revolutionizing the healthcare industry. In this project, we have designed the IoT Based Patient Health Monitoring System using Arduino. This IoT device read the pulse rate and measure the surrounding temperature. It continuously monitors the pulse rate and surrounding temperature and updates them to an IoT platform with the help of lcd display.

The Arduino Sketch running over the device implements the various functionalities of the project like reading sensor data, converting them into strings, passing them to the IoT platform, and displaying measured pulse rate and temperature on character LCD.

KEYWORDS: Arduino, Pulse Sensor, Temperature Sensor, LCD Display.

I. INTRODUCTION

The main concept of the project is to collect the data of patient with the help of pulse sensor and temperature sensor with the help of iot. The arduino board which collect the data of patient health like temperature and the heart beat of the patient with the help of the temperature sensor and the pulse rate sensor and the collected data of the patient health will be the display on the LCD display board. the temperature sensor and the pulse sensor which sends the data to the arduino board and that data will send to the LCD display board. These iot based health monitoring system which help the patient to check the status of the health of the patient immediately. if the temperature and the pulse rate is high or low of the patient then patient need to hospitalized immediately. today some of the take to much stress and these stress affect on the health and you don't know about your health but this iot devices help to the check your health status day-to-day.

II. LITERATURE REVIEW

1. This project is a proposed design to check the status of the health of the patient in day-to-day in daily life. the iot based health monitoring system is used to check the temperature and pulse rate of the patient.
2. The arduino board which collects the data of the patient with the help of the temperature sensor and the pulse sensor and this data arduino will send to the LCD display board .
3. This devices is much cheaper than the other health monitoring system available in the market.

III. DESIGN

3.1 Architectural model of Patient Health Monitoring System

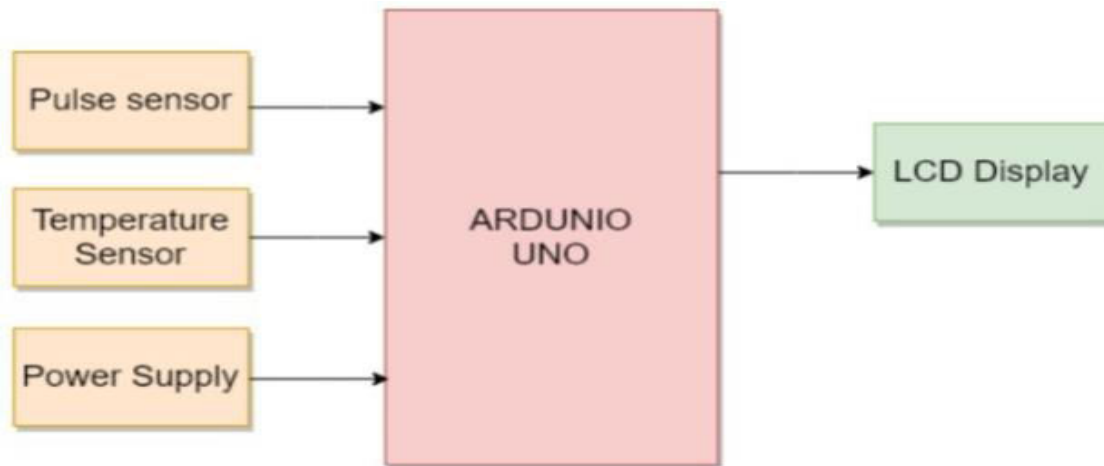


Fig-1: Architectural model for Patient Health Monitoring System

Sender/Receiver side: The arduino which collect the data of the patient and send to the LCD display Board.

Internal working side: Arduino UNO supplies power to all devices either by taking power from the battery and the pulse sensor and the temperature sensor send the data of the patient to the arduino uno board .these data which sends to the display board with the help of the arduino uno board. The temperature sensor is responsible for the sending the data of the patient to the arduino .the pulse sensor which is also responsible for the sending the data of heart beat of the patient to the arduino. The power supply is managed by the arduino.The LCD display which collect the data of the patient like temperature and the pulse rate through the arduino uno board.

3.2 Circuit Diagram of Patient Health Monitoring System

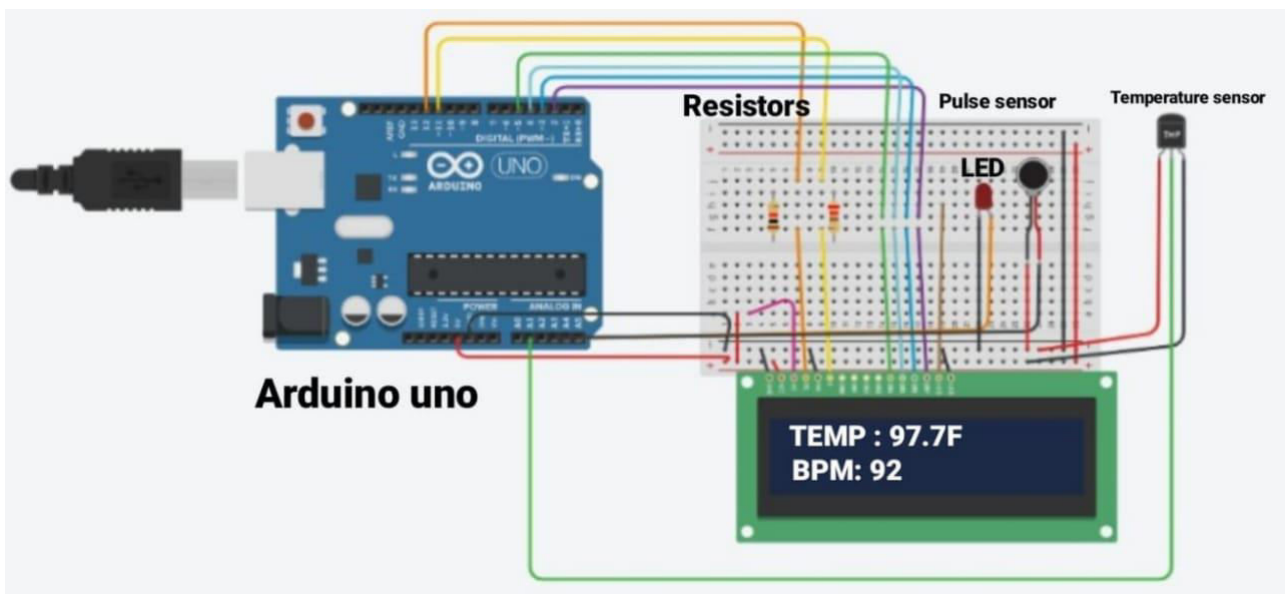


Fig-2: Circuit Diagram for IOT Based Health Monitoring System

The circuit contains Arduino UNO Board, temperature sensor, pulse sensor and the LCD display. In this circuit we use 1k and 2k resistor to control the voltage of power supply for the Arduino Uno board. Pin 1: Ground: Connected to the ground of the circuit. Pin 2: Tx/GPIO – 1: Connected to Rx pin of programmer/usb to upload program. Pin 3: GPIO – 2: General purpose Input/output pin. Pin 4: CH_EN: Chip Enable/Active high. Pin 5: Flash/GPIO – 0: General purpose Input/output pin. Pin 6: Reset: Resets the module. Pin 7: RX/GPIO – 3: General purpose Input/output pin. Pin 8: Vcc: Connect to +3.3V only

3.3 IOT Based Patient Health Monitoring System Requirements

- 3.3.1 Hardware Requirements:
- Arduino UNO
 - LCD Display
 - Pulse Sensor
 - Temperature Sensor
 - Resistors (1K, 2K)
 - LED (5mm LED any Color)
 - Jumper Wires
- 3.3.2 Software Requirements:
- Windows OS
 - Arduino IDE Software

IV. WORKING

- According to the diagram shown in Fig-1, the project module consists of Arduino, Pulse Sensor and LM35 Temperature Sensors measure BPM & Environmental Temperature respectively. The Arduino processes the code and displays it to 16*2 LCD Display. The data of patient with the help of pulse sensor and temperature sensor with the help of IoT. The Arduino board which collects the data of patient health like temperature and the heart beat of the patient with the help of the temperature sensor and the pulse rate sensor and the collected data of the patient health will be displayed on the LCD display board. The temperature sensor and the pulse sensor which send the data to the Arduino board and that data will be sent to the LCD display board. This IoT-based health monitoring system helps the patient to check the status of the health of the patient immediately.

4.1 Steps to connection of circuit

1. Connect Pulse Sensor output pin to A0 of Arduino and other two pins to VCC & GND.
2. Connect LM35 Temperature Sensor output pin to A1 of Arduino and other two pins to VCC & GND.
3. Connect the LED to Digital Pin 7 of Arduino via a 220-ohm resistor.
4. Connect Pin 1, 3, 5, 16 of LCD to GND.
5. Connect Pin 2, 15 of LCD to VCC.
6. Connect Pin 4, 6, 11, 12, 13, 14 of LCD to Digital Pin 12, 11, 5, 4, 3, 2 of Arduino.

Advantages of Patient Health Monitoring System.

- a) Remote monitoring: Real-time remote monitoring via connected IoT devices and smart alerts can diagnose illnesses, treat.
- b) Prevention: Smart sensors analyse health conditions, lifestyle choices and the environment.
- c) Reduction of healthcare costs: IoT reduces costly visits to doctors and hospital admissions and makes testing.

Disadvantages of Patient Health Monitoring System.

- a) It requires interoperability tests to be conducted before launching the IoT system for use. This will incur costs on the IoT device manufacturers and network service providers.



- b) It will take some time for IoT system to become completely stable as there are new and upcoming standards being integrated in the IoT system. Common IoT architecture will help in this regard.

V. RESULTS AND CONCLUSION

- Proposed system can be used to monitor the patient's temperature and heart beat rate continuously, effectively and remotely.
- The doctor can observe patient's health remotely from anywhere across the world and depending upon measures can give consultation and patient needs not to go for O.P.D.(Out Patient Department) in hospital.
- Thresholds have been set for both temperature and heart beat rate. If any one or both of the values cross the threshold then notification is given on the smart phone by the BLYNK app that we used.
- Also proposed system is cost effective as components used are affordable. It's compact in size, light weight and easy for carrying along with patient anywhere.
- The proposed system is a systematic and acceptable for effective assistance to the heart patients.

VI. FUTURE WORK

The future scope for this project is sensing and displaying other parameters of a patient like ECG, blood pressure, glucose level. Also GPS can be used to enhance this project. The GPS can find the position of patient and this technology can help the doctor to take preventive actions

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