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HEART MONITORING SYSTEM USING IOT

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ABSTRACT

The paper mainly focuses on monitoring of heart-rate and diseases related to it. The heart monitoring system uses IOT technology. IOT is a leading technology in today's world. It makes use of different types of sensors and other electronic components. The sensor used here is a pulse sensor. A pulse sensor is used to sense the patient's heart beat. This sensed data is displayed on an arduino IDE. For this purpose an arduino board is used. Once the data is visible on the IDE, it is then sent to the cloud using a micro controller known as NodeMCU. This controller helps in sending the data through cloud and makes it available for the user online. The cloud used is a blynk application. In this the user can view the heart rate instantly and gets an alert message if the condition is critical.

Keywords: IOT, Pulse Sensor, Node MCU, Arduino IDE.

INTRODUCTION

The technology used is IOT. The Internet of Things is a buzz word. As technology evolves it makes use of electrical components and other softwares making it available to the users all over the world.

This project describes a heart monitoring system using a pulse sensor, arduino UNO and NodeMCU. A pulse sensor is used to sense the patient's heart beat. It's a very handy device. It's just placed on the patients fingers, armpit etc, to monitor the heart rate. Arduino UNO and NodeMCU is a micro controller, which helps in sending the sensed data to the internet.

The internet platform used is a blynk application. Blynk is an easy to use application for the ones developing an IOT project. One can create any number of projects in this application and use it simultaneously without any efforts. There are so many other platforms like thingSpeak which is also a good option.

The working of the project starts when a user places the sensor on his/her fingers the reading of his heart rate is sensed. This reading is in user understandable format, that is, it's in beats per minute (BPM). This helps the user diagnose his self. The sensed data is then displayed on the arduino IDE using an arduino board. Now this data is made available on the internet using another micro controller called NodeMCU. The internet platform used is blynk. Blynk is an application which can be used in ones android device. The user is supposed to open the created project and then connect it to the corresponding micro controller. In this way user can see the readings online. This makes the application user friendly and can diagnose their selves when in need. If the condition is critical an emergency alert will be sent to the doctor and further treatment can be carried out.

This project helps the common man, as it is very cheap and easily available in the market. Also, helps the user to diagnose their selves before consulting a doctor and keep a check on their health.

BACKGROUND

Libraries

1. ESP8266WiFi library

It's used to connect new ESP8266 module to Wi-Fi network to start sending and receiving data.

2. Blynk

Blynk Library is used for communication between hardware, Blynk Cloud and Blynk Application.

3. DFRobot Heart-rate

This library is for the pulse sensor testing. It is included in the main code wherein the output of this is pushed into the blynk app.

4. Software Serial

An ESP8266 port of Software Serial library supports baud rate up to 115200.

Boards

1. NodeMCU 1.0 (ESP-12E Module)

This is a micro controller which helps to send data online.

2. Arduino

Is also a micro controller that connects sensors and displays it on the IDE.

Packages

Arduino Development Environment

This platform helps in uploading arduino codes and displays the sensed data on the output screen.

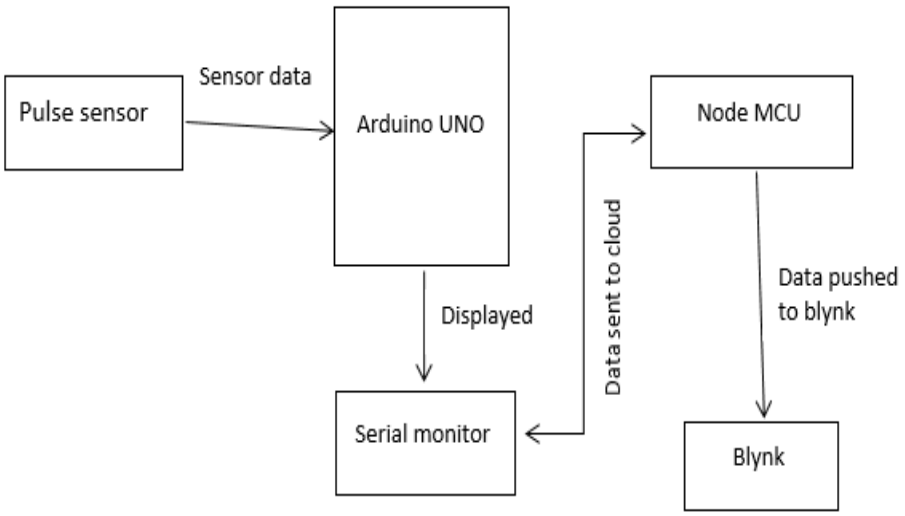
Blynk

It is a platform used in android and IOS. This helps in building IOT projects and display the reading of the sensor online. User can read the data from anywhere.

PROPOSED WORK

This paper focuses on building a heart monitoring system using IOT. Proposed system consists of a pulse rate sensor, Arduino Uno and Node MCU ESP8266 Mod. This system measures heart rate of an infant to an elderly person. The low cost of the device helps to provide appropriate heart rate monitoring system. In this paper a pulse sensor is connected to the Arduino UNO board and readings of the heart rate is displayed on the serial monitor. For this data to be sent to the cloud a node MCU is used. The data on the serial monitor is pushed to an application known as blynk which is an IOT platform. The values from the sensor can be seen on the blynk app in real time. This helps the doctors or patients for early detection of any problem in the heart and to have a healthy life.

FLOW DIAGRAM



ENVIRONMENTAL SETUP

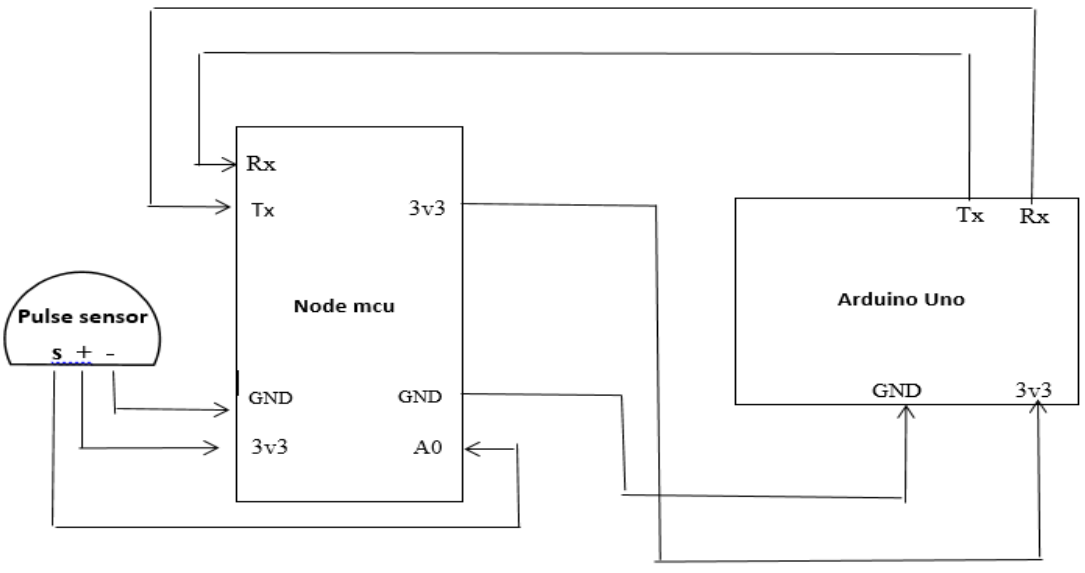
Hardware specification:

Arduino UNO board
Node MCU esp8266 mod
Jumper wires
Pulse sensor
USB cable

Software specification:

Tool: Arduino IDE
Operating system: Windows 8.1
Libraries: Esp8266, node mcu, blynk, DFRobot Heart-rate
Application: Blynk

Circuit diagram



RESULTS AND DISCUSSIONS

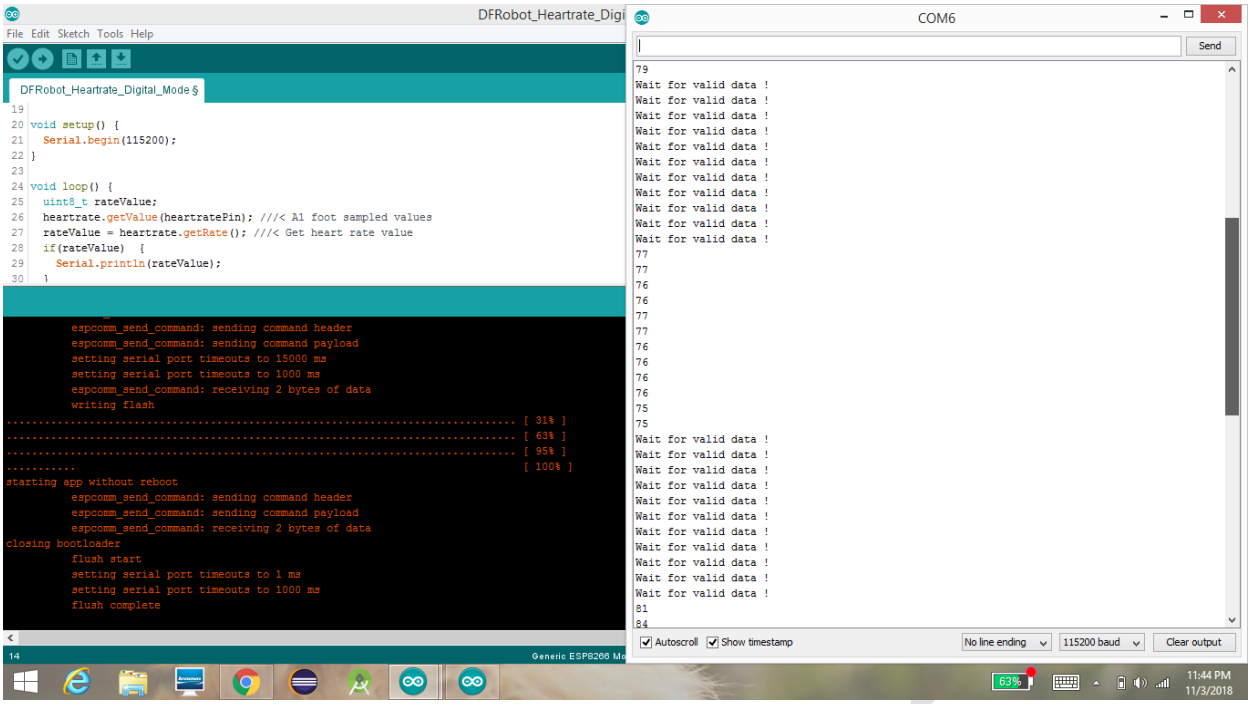


Figure1. DFRobot_Heart_Digital_mode

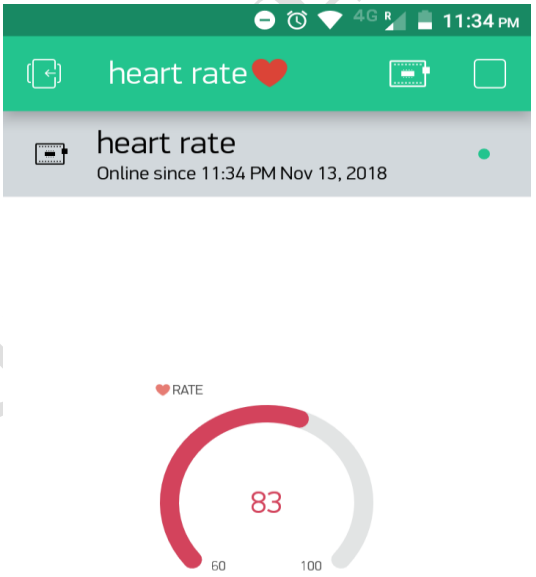


Figure2. Blynk output

CONCLUSION

In These days we have an increased number of heart diseases. The proposed system uses sensors that allow detection of heart rate of a person using heartbeat sensor even if the person is at home.

The sensor is then interfaced to a micro-controller that allows checking heart rate readings and transmitting them over internet. When patient heart beat goes above a certain limit, the system sends an alert to the controller which then transmits this over the internet and alerts the doctors. Also, the system alerts for lower heartbeats. Whenever the user logs on for monitoring, the system also displays the live heart rate of the patient. Thus, concerned ones may monitor heart rate as well get an alert of heart attack to the patient immediately from anywhere and the person can be saved on time.

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