

IoT Based Patient Monitoring System Using Nodemcu

K.Shirisha¹, K.Shivani²

¹Assistant Professor, Dept of Computer Science and Engineering

²Dept of Computer Science and Engineering

^{1,2}Mahatma Gandhi Institute of Technology Hyderabad, Telangana, India-500075

Abstract- Today Internet has become one of the important part of daily life. It has changed how people live, work, play and learn. Internet serves for many purposes educations, finance, Business, Industries, Entertainment, Social Networking, etc. IOT are the connected objects to the Internet and used to control the objects or remote monitoring. A health care monitoring system is necessary to constantly monitor the patient's physiological parameters. The main advantage of this system is that the results can be viewed at any time and place. The doctors can be notified by using mobile phones whether patient health is abnormal or not. The system can analyze the signal to detect normal or abnormal conditions. In the system, the internet of things (IOT) is becoming a major platform for many services and applications. The IOT is generally considered as connecting objects to the Internet and using that connection for control of those objects or remote monitoring.

Keywords- Heart pulse sensor, Nodemcu, esp8266 Wi-Fi module, Blynk

I. INTRODUCTION

The healthcare sector is going through a huge change, with digital capabilities changing the way doctors interact with their patients. Nowadays, patients have the tools to view their key vitals themselves and help doctors to have immediate access to patient data. According to the National Broadband Plan (2015) by the Federal Communications Commission (FCC), the use of patient monitoring under IOT technology will save the healthcare industry \$700 billion over 15 to 20 years. Then it is important to focus on the IOT technology to benefit from the most recent technology. Heartbeat sensor measures the heartbeat which lies between 60-100 bpm. Internet of Things means interconnecting of devices that reduce intervention of humans and making life in a better way.

II. PROBLEM DEFINITION

Monitoring and Recording of various medical parameters of patient outside hospitals has become Widespread phenomenon. The function of this system is to measure some biological parameter of the patient's body like Temperature, Heartbeat, Blood Pressure, by using sensors and

the sensors will sense the body Temperature, Heartbeat and Blood pressure of the patient and sends the values to IOT Cloud platform through WIFI-Module.

All the information about the patient health will be stored on the cloud, it enables the doctors to monitor patient's health, where the doctor can continuously monitor the patient's condition on his Smart phone. In any critical condition the SMS will be send to patient's doctor. \

III. DESIGN METHODOLOGY

The circuit diagram works in such a way that the pulse rate sensor takes the input in analog waveform and gives it to the analog input to the nodemcu. The nodemcu has only one analog input where it takes the input and send it to the cloud through internet using wifi and the data is stored in the cloud. The stored data from the cloud is then taken to a mobile device and it can be seen anywhere by the doctor using the mobile device.

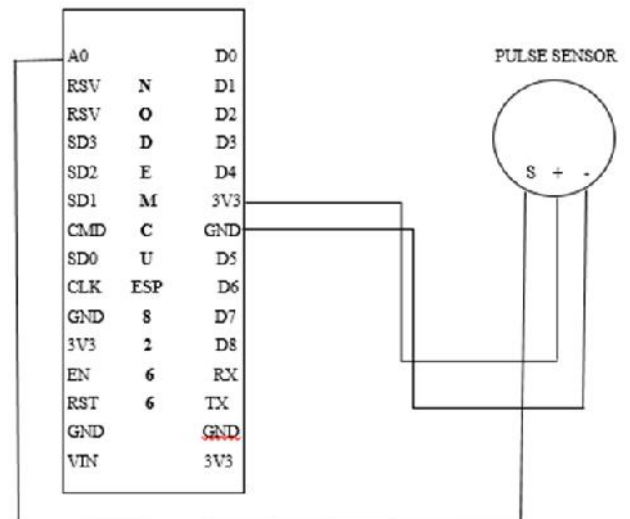


Figure 1: The above figure is the block diagram of patient monitoring system.

i. Modules

ESP8266 Wi-Fi Module:

ESP8266 comes with capabilities of

- 2.4 GHz Wi-Fi(802.11 b/g/n, supporting WPA/WPA2), general-purpose input/output (16 GPIO),
- Inter-Integrated Circuit (I²C) serial communication protocol, analog-to-digital conversion (10-bit ADC)
- Serial Peripheral Interface (SPI) serial communication protocol, UART (on dedicated Pins, plus a transmit-only UART can be enabled on GPIO2), and pulse-width modulation (PWM).

ESP8266 module is low cost standalone wireless transceiver that can be used for end-point IOT developments.

To communicate with the ESP8266 module, microcontroller needs to use set of AT commands. Microcontroller communicates with ESP8266-01 module using UART having specified Baud rate.

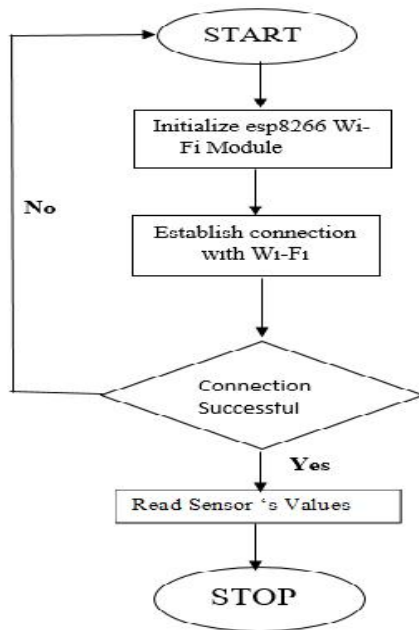


Figure 2: The above Figure shows the Flowchart of Patient Monitoring System

ii. Implementation

The implementation of Patient Monitoring System involves the writing and compilation of program use it without any necessary being an expert programmer. Arduino offers an open-source electronic prototyping platform that is easy to use and flexible for peoples who are beginners in this field with both the software and hardware perspective. Sensors are

connected to the nodemcu and microcontroller is able to sense the environment through receiving input from sensors.

IV. RESULTS

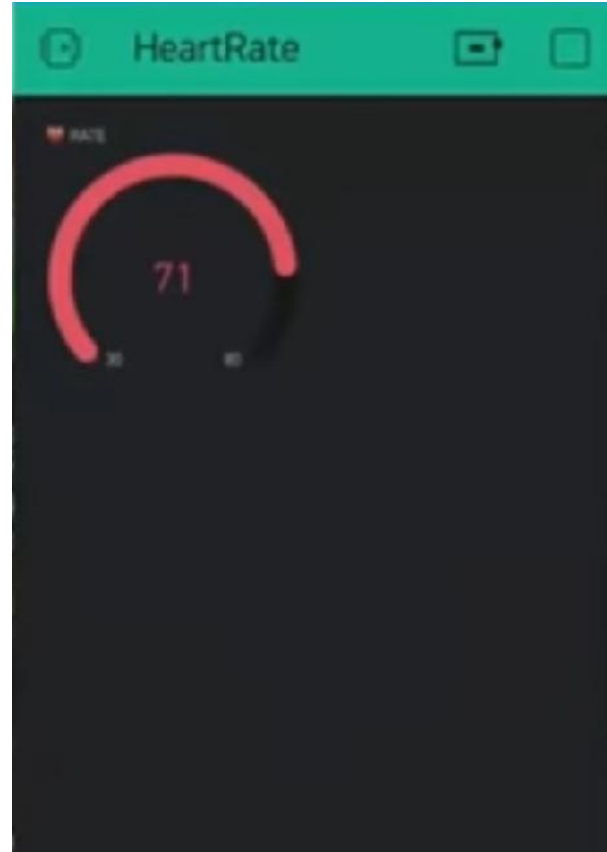


Figure 3: The above figure shows the Result window of Heart beat rate of Patient

The above figure 3, shows the heart beat rate of the patient by using the pulse sensor, the sensor has three pins are signal(S), voltage (+), ground (-). The sensor pins are connected to the nodemcu, signal pin to D0, + pin to VCC and - pin to GND and the nodemcu is connected to the computer and we connect to blynk using Wi-Fi and by using gauge we can see the heart beat rate.

V. CONCLUSION

The monitoring system can monitor, the patients all the time. The health parameters data are stored in blynk. Internet of things (IOT) is expected in various fields but more benefited in the field of healthcare. Health monitoring for ICU (Intensive Care Unit) patients need to monitor vital signs from time to time. By using the system, it reduces time and hence the patient monitoring system is designed. As a result, the doctor can examine his patient from anywhere and anytime. It can be allowed the doctors or nurses easily to use the

computer for checking and to save in the database. Based on the work, doctors have been able to use mobile devices and can be implemented in a global network with the help of the nodemcu. Pulse sensor is connected to the nodemcu and the data is fetched and given to the blynk app where the doctors can view the patient data time to time.

VI. FUTURE SCOPE

We can add a GPS module in IOT patient monitoring using Node MCU. This GPS module will find out the position or the location of the patient using the longitude and latitude received. Then it will send this location to the cloud that is the IOT using the Wi-Fi module. Then doctors can find out the position of the patient in case they have to take some preventive action.

Now a days people are suffering from BP and heart attacks so if we add BP, ECG, EEG sensors in this project. With the help of these sensors we will find Blood pressure and we will check heart condition. Wi-Fi is an attached module connected to Node MCU. It is better if it is in built so, complexity can be reduced.

REFERENCES

- [1] Raja Lavanya, M. Nivetha, K. Revasree and K.Sandhiya, "Smart Chair-A Telemedicine Based Health Monitoring Systems using pulse sensor" in, IEEE, 2018.
- [2] Naoki Hagiyama, Akihisa Mito , Harutoyo Hirano , Zu Soh , Etsunori Fujita, Yumi Ogura , Ryuichi Uchikawa , Shigehiko Kaneko, "Unconstrained Monitoring of Biological Signals Using an Aortic Pulse Wave Sensor", IEEE 2018.
- [3] Sharanbasappa Sali. "Health Monitoring System Using Wireless Sensor Network", January 2018, pp.04-12.
- [4] "Kuo-Kai Shyu, Luan-Jiau Chiu, Po-Lei Lee, Tzu-Han and Shun-Han Yang", Respiratory and pulse Rates using UWB radio detection and ranging sensing element information exploitation FVPIEF based mostly Two-Layer EEMD, IEEE 2018.
- [5] Naoki Hagiyama, Akihisa Mito, Harutoyo Hirano, Zu Soh, Etsunori Fujita, Yumi Ogura, Ryuichi Uchikawa, Shigehiko Kaneko, "Unconstrained Monitoring of Biological Signals Using an Aortic Pulse Wave Sensor", IEEE 2018.