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Implementation of heart beat and blood pulse flow rate Monitoring with web page

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ABSTRACT: **The upcoming ageing society and emerging of some newly discovered chronic diseases, the demand of hospital nursing for people has significantly increased. For every disease knowing the heart beat per minute rate is Mandatory. The heart beat is indirectly depends on temperature i.e. when the Temperature is high then glucose levels will be decrease and brain sends a signal to heart to increase the blood pumping rate is nothing but heart beat. If any of these parameters are abnormal then the data will be automatically sent to the doctor's mobile through GSM. So we can know the details whenever we want.**

Keywords **–Microcontroller, Optical sensor, Temperature Sensor**

I. INTRODUCTION

The heartbeat of a person can be measured through a finger tip i.e. means when blood pumps from heart to body and that makes the blood volume inside the finger supply route to change time to time(1). This fluctuation is detected by an optical sensing mechanism. This design is accurate and low cost implementation. The nature temperature at present noticed by the general purpose temperature sensor. When the heart beat of a person reaches to abnormal levels it sends an indication to the doctor (or any other concerned person) normal heart Beats per Minute (BPM) is 72.the general heart beat rating shown in tableno: 1 [7], [10], and [11]

AGE	MIN	MAX
1-3	80	117
3-12	69	120
13-19	70	120
20-24	75	132
25-35	75	135
40-45	75	135
50-60+	75	140

According to survey conducted by Joanna Piercy · Kip Rogers · Michelle Reichert1· Denis V. Andrade Augusto S. Abe, Glenn J. Tattersall, William K. Milsom. From 1973 to 2006 by the different personse in different conditions like when the person is moving, quite, alert and sleeping condition, the temperature variations from difference as [7],[8] normal rate to presence rate shown in figure1

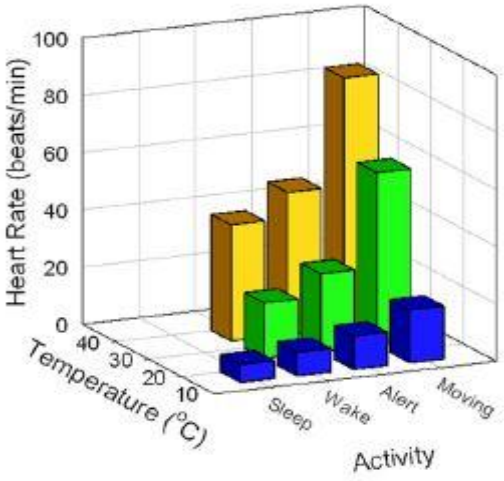
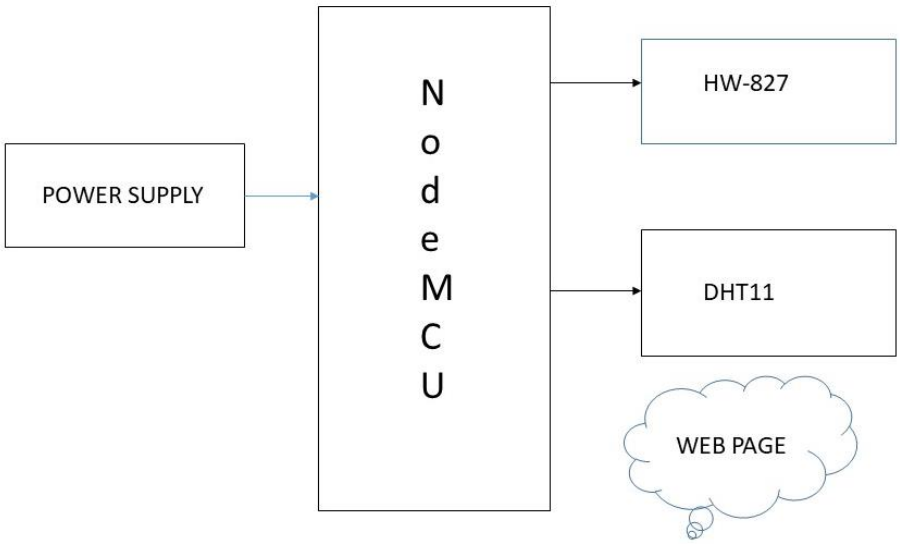


Fig2
The heart rate variation with respective temperature and different activity based differences compared with normal temperature

1.1 SYSTEM HARDWARE BLOCKS:



1.2 BLOCK DIAGRAM SHOWN BELOW WITH HARDWARE BLOCKS

A heart rate monitoring system using **Node MCU**, **HW-827 sensor**, and **DHT11** sensor is designed to measure heart rate and temperature and display the data on a web page. Node MCU (ESP8266): Microcontroller with built-in WiFi to read sensor data and send it to a web page. HW-827 Heart Rate Sensor: Measures heart rate (pulse) using an infrared LED and a photodiode..DHT11 Temperature & Humidity Sensor: Measures ambient temperature and humidity .Web Page (HTML & JavaScript):

Displays real-time heart rate and temperature readings. Power Supply (5V): Powers Node MCU and sensors.

The system consists of the following key connections:

[1] HW-827 Heart Rate Sensor to Node MCU:

- VCC → 3.3V (or 5V) of Node MCU
- GND → GND of Node MCU
- Signal → Digital Pin (D5 or any GPIO)

[2] DHT11 Sensor to Node MCU:

- VCC → 3.3V (or 5V) of Node MCU
- GND → GND of Node MCU
- Data → Digital Pin (D6 or any GPIO)

[3] Node MCU WiFi Connection:

- Reads heart rate and temperature data.
- Sends the data to a web page via WiFi.
- Hosts an HTML page to display the data dynamically.

[4] Web Page:

- Uses HTML, CSS, and JavaScript.
- Auto-refreshes to show live data.
- Displays heart rate and temperature in a readable format.

1.3 Working Principle

1. The **HW-827** detects the pulse rate and sends digital pulses to Node MCU.
2. The **DHT11** sensor reads the temperature and sends data to Node MCU.
3. The **Node MCU** processes the data and transmits it via WiFi.
4. A **web page** designed in **HTML, CSS, and JavaScript** fetches and displays the data.
5. Users can monitor heart rate and temperature remotely using any web browser.

1.4 Web Page Design Overview

[1] HTML: Creates the basic structure (heading, labels, and data fields).

[2] CSS: Styles the interface.

[3] JavaScript: Fetches data from NodeMCU and updates the values dynamically.

III RESULTS

Fig1
Hard ware design

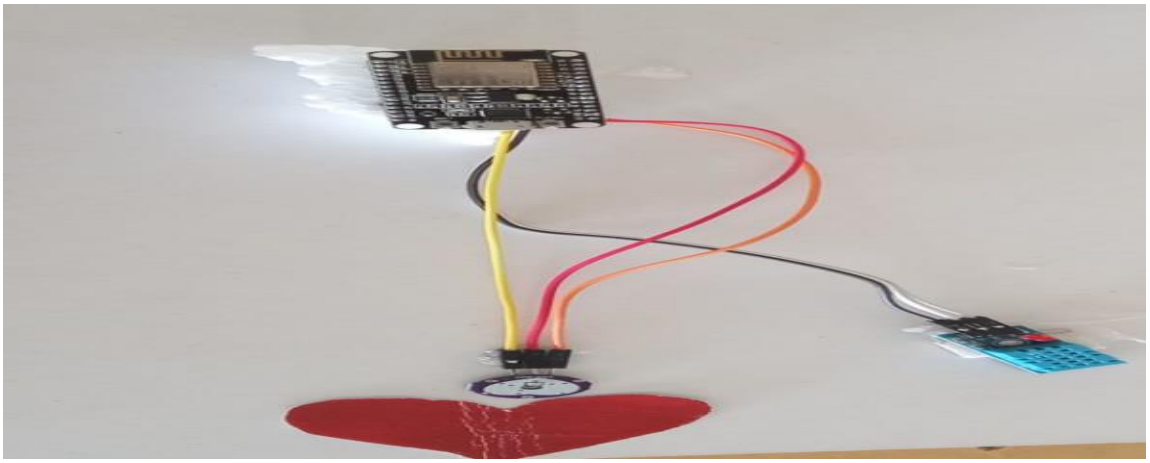
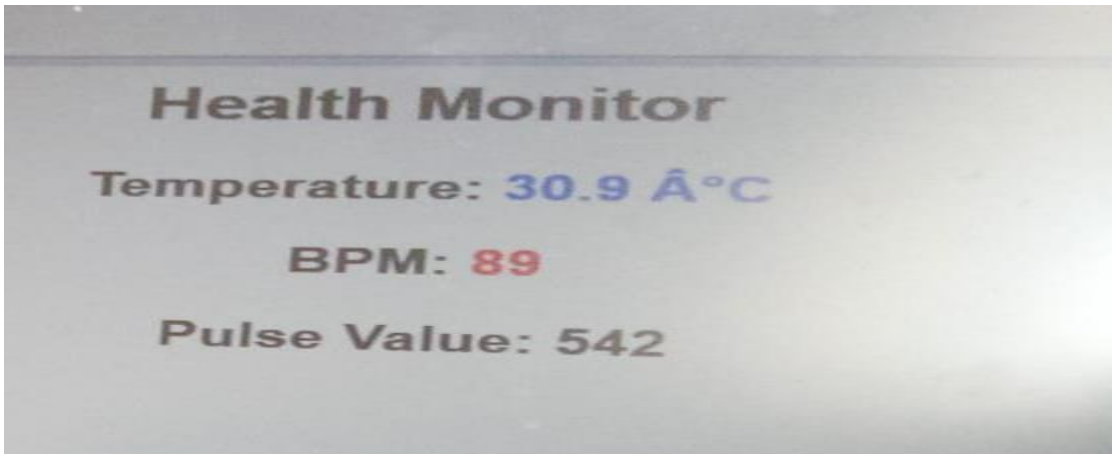


Fig2



Web page output

3.1 FEATURES

This system consumes low cost to develop and having good sensitivity of measuring pulse more over it is simple and sensible temperature rating, and easy communicating data through GSM modem

IV. CONCLUSION

In this paper mechanism to continuously monitor the heart BPM and body temperature of a person is illustrated using a microcontroller interfaced with an optical sensor unit. This design is interfaced with a GSM module so that when the heartbeat and body temperature reaches to abnormal level a message is sent to the doctor. It is an intrusive process and the patient can be monitored 24x7 without much medical assistance from outsiders.

V. FUTURE SCOPE

The implementation will not be accurate when the blood levels of the person to be monitored are low. So in place of normal optical sensor powerful IR sensors can be replaced so that the heartbeat of those persons can also be monitored easily. Even continuous monitoring of blood pressure can also have implemented as it is also important parameter while diagnosing the diseases and by inter facing different sensors like humidity and modules like GPS we can increase the performance and present condition.

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