Heart Attack Detection and Heart Rate Monitoring Using IoT

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ABSTRACT

Nowadays numerous persons are mislaying their life owing to heart attack and shortage of medical attention to patient at correct stage. Hence, in this project we are implementing heart rate monitoring and heart attack recognition system using IoT. The patient will carry hardware having sensors with android application. The heartbeat sensor will allow checking heart beat readings and transmit them over the internet. The user may set the high and low level of heartbeat limits. Once these limits are set the system can start monitoring the patient’s heartbeat and as soon as the heart beat readings goes above or below the limit set by the user the system will send an alert about high or low heartbeat as well about chances of heart attack.

Keywords:  
Heart rate sensor, Monitor, Detect, IoT, Android smart phone.

INTRODUCTION

These days a number of people are losing their life due to heart attack. Heart attack can occur when the flow of blood to heart is blocked. Owing to late diagnosis of heart attack we are inadequate to save the lives of many humans. In this paper, we suggest a system that will detect heart attack by monitoring the heart rate based on IoT (Internet of Things). For a healthy adult, ordinary heart rate is 60 to 100 bpm (beats per minute). Athlete’s heart beat generally range from 40 to 60 bpm depending upon their fitness. If a person’s heart rate is constantly over 100 beats per minute then the person is said to be having higher heart rate which is also notorious as tachyarrhythmia. It can diminution the efficiency of heart by letdown the amount of blood pumped through the body can result in chest pain and lightheadedness. With the advancement in technology it is easy to monitor the patient’s heart rate even at home. IoT is dexterity of network mechanism to intellect and gather information from world ubiquitously us then share the information athwart internet anywhere it can be managed for some tenacity.

LITERATURE SURVEY

Table 1. Comparison of diverse existing Garbage Monitoring System

<table>
<thead>
<tr>
<th>Sr.No.</th>
<th>Title of Papers</th>
<th>Year</th>
<th>Sensors and Technology Used</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>IoT based Heart Attack Detection, Heart Rate and Temperature Monitor[1]</td>
<td>2017</td>
<td>Pulse sensor, ESP8266 wi-fi module, LM35 temperature sensor, Arduino Uno</td>
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<tr>
<td>3</td>
<td>IoT Based Heart Attack Detection and Alert System[5]</td>
<td>2017</td>
<td>Analog sensor, wireless module, ECG leads, AVR microcontroller</td>
</tr>
<tr>
<td>4</td>
<td>IoT on Heart attack detection and heart rate monitoring[6]</td>
<td>2016</td>
<td>MI Band 2, android phone, Big Data Analytics</td>
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<td>5</td>
<td>Heart attack detection using Android Phone[7]</td>
<td>2016</td>
<td>ECG monitor, Android phone</td>
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<td>6</td>
<td>Heart rate monitoring and Heart attack detection using wearable Device[8]</td>
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<td>Smart band, Android phone</td>
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<td>7</td>
<td>Heart rate monitoring system using finger tip through Arduino and processing software [2]</td>
<td>2016</td>
<td>Fingertip sensor, Arduino Uno, Nodemcu, Android Phone</td>
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<td>8</td>
<td>Heart attack detection and Medical attention using Motion Sensing Device-Kinect[3]</td>
<td>2014</td>
<td>Kinect, Xbox one</td>
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<td>9</td>
<td>Heart attack detection using Smart Phone[9]</td>
<td>2013</td>
<td>Smart Phone</td>
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</table>
PROPOSED WORK

The proposed system have eminence of detecting heart attack with help of observing heart rate based on internet of thing. Our method uses a pulse sensor, Arduino board and a Wi-Fi module. After setting up the system, the pulse sensor will start sensing heart rate readings and will display the heartbeat of person on LCD screen. Also, with the use of Wi-Fi module it will transmit the data over internet. System allows a set point which can help in determining whether a person is healthy or not by checking his/her heartbeat and comparing it with set point. After setting these limits, the system will start monitoring the heart rate of patient and immediately the heart rate goes above or below the certain limit the system will send an alert message. As a part of this project we are implementing an android application model that will track the heartbeat of particular patient and monitor it correctly and give the emergency message on chances of heart attack.

Fig. 1. System Architecture

IMPLEMENTATION

A. The Arduino Uno

Arduino uno, it is a microcontroller board. It is based on ATmega328. Moreover, there are 14 digital input and output pins of which six can be used as PWM outputs. RX and TX pins are utilize for communication between arduino board, computer or additional devices for serial communication. It has operating voltage of 5V. The ATmega 328 has 32KB of flash memory for storing code. The ICSP (in-circuit serial programming) header will permit us to use an outside programmer to upload software to our microcontroller unit[10].

Figure 2. Arduino uno board [4]
B. Pulse Sensor

Figure.3. Pulse Sensor with Arduino [11]

For arduino, the pulse sensor is plug and play heart rate sensor. It can be utilized by any persons who want to simply include live heart rate information into their developments. The sensor displays the movement of blood through the finger and is intended to give numerical output of heart beat once a finger is positioned on it[12].

C. NodeMCU ESP 8266

Figure.4. NodeMCU ESP 8266 [13]

The Node Microcontroller Unit (NodeMCU) is open source software and hardware enlargement background that is constructed everywhere a very inexpensive system on a chip named the ESP8266. In our System we have used NodeMCU to receive data from Arduino and send that data over internet[14].

RESULTS AND ANALYSIS

After setting up the system, check all the connections. Once the system is ready upload the source code. After uploading the code place the index finger on the heartbeat sensor. The heartbeat sensor will start monitoring the pulse rate. LCD is used for displaying the calculated pulse rate.
The system has configured maximum range of heart beat. Once the system starts measuring the Human heart beat, if it crosses the set limit then the system will send alert about heart rate. Also the system alerts for lower heart rate.
The reading from sensor will be uploaded to server where data will be store. The readings will be refreshed consistently giving the extension for constant seeing of the patient.

CONCLUSION
In this exploration we have attempted to propose a total paper on detecting heart attack by monitoring the heartbeat of person. The heart beat sensor which is interfaced with microcontroller senses the heartbeat of person and transmits them over internet using Wi-Fi module. System allows setting limits of heart beat. After setting these limits person can start monitoring the heart beat and whenever the person’s heart beat goes above certain set point they can get an alert on high heart beat and also about chances of heart attack. Also the system alerts for lower heartbeat.

REFERENCES