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Heart Attack Detection Using IOT

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ABSTRACT: We all know heart attack can kill your life in 3 attempts but now a days it can be dangerous in first attempt also. If checking our health regularly on daily basis then we can detect so many different diseases by detecting them previously, Life is precious. Many people among us lose their life to heart attack. This is because of their diet, age, less physical activity and many other factors. Heart attack is not easy to detect. To overcome and help our society from heart diseases and attack, we are developing such a system which will help to decrease the death rate and early detection a heart attack. In this system we are implementing a heartbeat monitoring and heart attack detection system using the Internet of Things. The sensor is then interfaced to a microcontroller that allows checking heart rate readings and transmitting them over Internet using NODEMCU Module. The user may set the high as well as low level of heart beat limit. After setting these limits, the system starts monitoring and also alerts for lower heartbeats. For this the system uses two circuits. One is the transmitting circuit which is with the patient and the other is the receiver circuit which is being supervised by the doctor or nurse. The system makes use of heart beat sensor to find out the current heart beat level and display it on the LCD screen.

INTRODUCTION

This system can detect pulse, temperature regularly with the help of sensor. Doctor can set the threshold for all parameters. If these parameters cross the maximum limit, System send notification on server through WiFi. In the new era of communication and technology, the explosive growth of electronic devices, smart phones and tablets which can be communicated physically or wirelessly has become the fundamental tool of daily life. The next generation of connected world is Internet of Things (IoT) which connects devices, sensors, appliances, vehicles and other "things". The things or objects may include the tag, mobile phones, sensors, actuators and much more. With the help of IoT, we connect anything, access from anywhere and anytime, efficiently access any service and information about any object. The aim of IoT is to extend the benefits of Internet with remote control ability, data sharing, constant connectivity and so on. Using an embedded sensor which is always on and collecting data, all the devices would be tied to local and global networks.

The term IoT, often called Internet of everything, was 1st introduced by Kevin Ashton in 1999 who dreams a system where every physical object is connected using the Internet via ubiquitous sensors. The IoT technology can provide a large amount of data about human, objects, time and space. While combining the current Internet technology and IoT provides a large amount of space and innovative service based on low-cost sensors and wireless communication. IPv6 and Cloud computing promote the development of integration of Internet and IoT. It is providing more possibilities of data collecting, data processing, port management and other new services. Every object which connects to IoT requires a unique address or identification with IPv6. There are so many people in the world whose health may suffer because they do not have proper access to hospitals and health monitoring.

The Internet of things (stylised Internet of Things or IoT) is the internetworking of physical devices, vehicles (also referred to as "connected devices" and "smart devices"), buildings and other items-embedded with electronics, software, sensors, actuators, and network connectivity that enable these objects to collect and exchange data. In 2013 the Global Standards Initiative on Internet of Things (IoT-GSI) defined the IoT as "the infrastructure of the information society." The IoT allows objects to be sensed and/or controlled remotely across existing network infrastructure, creating opportunities for more direct integration of the physical world into computerbased systems, and resulting in improved efficiency, accuracy and economic benefit.

II. PROPOSED SYSTEM

Our system is designed to monitor the patient's health using Heartbeat Sensor, Temperature sensor and LCD in which Heart Beat rate and temperature values are displayed. The values can be updated through NODEMCU. If any abnormalities are seen then a message alert will be sent Using GSM.

Block Diagram for Proposed System

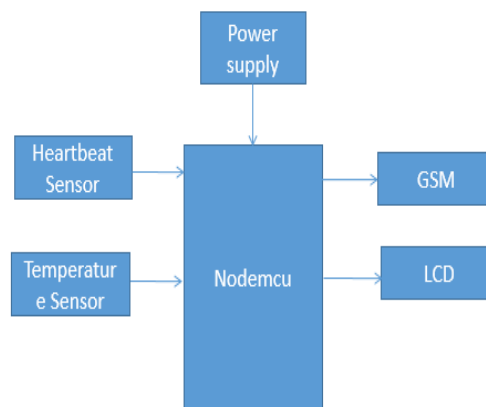


Fig: Block diagram of proposed method

Represents the work flow diagram for the proposed system. The ECG sensor and DHT11 sensor senses data and sends it to the NODEMCU ESP8266. Using the WiFi Module, the data is transmitted to the mobile application. Heartbeat Sensor is an electronic device that is used to measure the heart rate i.e., speed of the heartbeat. Monitoring body temperature, heart rate and blood pressure are the basic things that we do in order to keep us healthy.

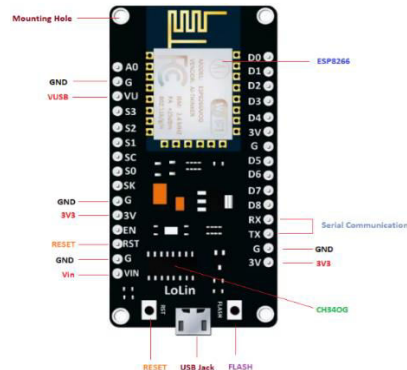
III. HARDWARE AND SOFTWARE REQUIRED

SOFTWARE:

Arduino is an open-source electronics platform based on easy-to-use hardware and software. Arduino boards are able to read inputs - light on a sensor, a finger on a button, or a Twitter message - and turn it into an output - activating a motor, turning on an LED, publishing something online. Arduino Uno is programmed using the Arduino Software (IDE). C, C++ and python programming languages are used in Arduino. Arduino programs are divided into three main parts namely: Structures, Values and Functions.

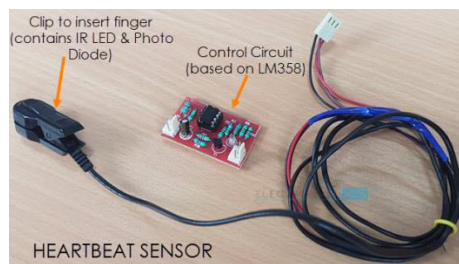
HARDWARE DETAILS:

1. NodeMCU: NodeMCU is an open-source firmware and development kit that plays a vital role in designing your own IoT product using a few Lua script lines. Multiple GPIO pins on the board allow you to connect the board with other peripherals and are capable of generating PWM, I2C, SPI, and UART serial communications.

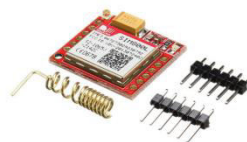


2. Power supply: It is a component that provides at least one electrical charge with power. It typically converts one type of electrical power to another, but it can also convert a different Energy form in electrical energy, such as solar, mechanical, or chemical. A power supply is an electrical device that supplies electric power to an electric load. The primary function of a power supply is to convert electric current from a source to the correct voltage, current and frequency to power the load.

3. Heart Beat Sensor: Monitoring heart rate is very important for athletes, patients as it determines the condition of the heart. There are many ways to measure heart rate and the most precise one is using an Electrocardiography. But the more easy way to monitor the heart rate is to use a Heartbeat Sensor. It comes in different shapes and sizes and allows an instant way to measure the heartbeat.



4. GSM /GPRS: These modules are one of the commonly used communication modules in embedded systems. A GSM GPRS Module is used to enable communication between a microcontroller and the GSM / GPRS Network. Here, GSM stands for Global System for Mobile Communication and GPRS stands for General Packet Radio Service.



5. LCD: The term LCD stands for liquid crystal display. It is one kind of electronic display module used in an extensive range of applications like various circuits & devices like mobile phones, calculators, computers, TV sets, etc. These displays are mainly preferred for multi-segment light emitting diode and seven segments. The main benefits of using this module are inexpensive; simply programmable, animations, and there are no limitations for displaying custom characters, special and even animations, etc.

IV. WORKING OF PROPOSED SYSTEM

The working principle of Heart Attack Detection using IOT is, we have to connect the components. After complete setting up of the kit then the power supply to the components NodeMcu, Arduino Uno, Heart Beat sensor, 16X2 LCD display, temperature sensor is given as 5v respectively. 12v power supply is given to the GSM module. We are interfacing NodeMcu with the LCD using register select, enable and 4 data lines. Here register select and enable pins

are control lines. Now we are interfacing temperature sensor, GSM Module, LCD to the NodeMcu module. Heart beat sensor is interfaced to the Arduino Uno board. Arduino Uno board is based on the Atmega328 micro controller. It is a 8 bit micro controller operated at 12MHz clock frequency. NodeMcu configurations are mentioned in the code. When we place our finger in the temperature sensor or when we give input to the temperature sensor, if temperature is greater than 34 degree Celsius and BPM value is greater than 100 (displays on the LCD) then a message alert is sent to the mentioned mobile number in the code using the wifi module present in the NodeMcu Module. For every initialization of the code BPM, heart beat and temperature values are uploaded to the server using the wifi module which is inbuilt in the NodeMcu Module. Then we can see the graphical representation of the heart beat of the patient in the wifi network which we have connected

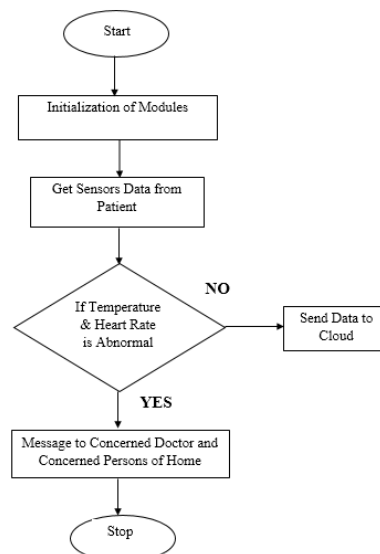


Fig: Flow chart of proposed system

The proposed prototype is a device that can be attached to the wrist of the patient. The pulse data from the patient's wrist is collected by the pulse sensor. The process of working is given in the flowchart as shown in Fig. 4. The data is transferred to the microcontroller, NodeMCU coded with different algorithms for heart patients and normal people. From the NodeMCU, the data is sent to cloud.

V. CONCLUSION

Now a day we have an increased risk of heart attacks. This system helps to detect heart rate of person using heart beat sensing even if person is at home. This system helps for

hospital monitoring system, all patient monitored by single person in server room. This system also helps to measure heartbeat, pulses of person.

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