

Heart Attack Detection By Heartbeat Sensing using Internet Of Things : 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 heart beat 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. 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.

Key Words: Heart beat sensing, Heart Attack Detection, Internet of Things(IoT),Heart beat sensor, ECG...

1. 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.

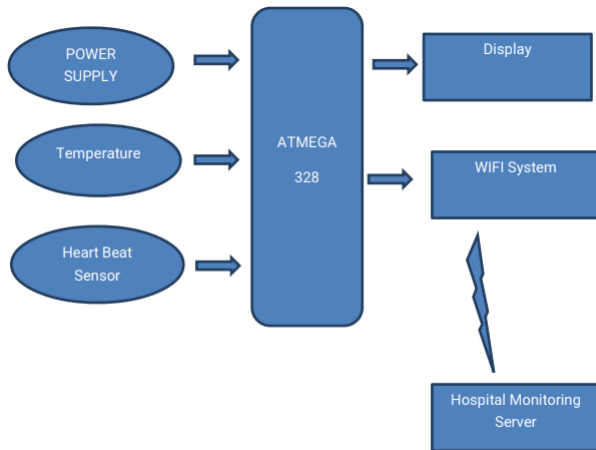


Fig-1 Internet of Things

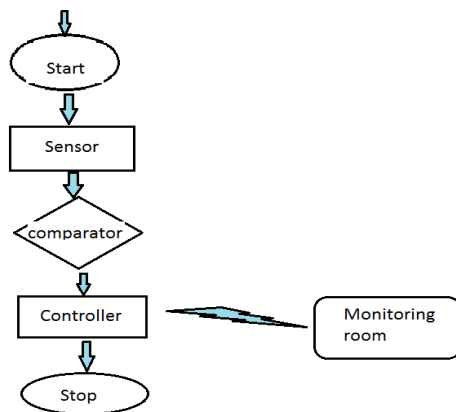
The Internet of things (stylised Internet of Things or IoT) is the internetworking of physical devices, vehicles (also referred to as "connected devices" and "smart devices"), buildings and other items-embedded with electronics, software, sensors, actuators, and network connectivity that enable these 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 computer-based systems, and resulting in improved efficiency, accuracy and economic benefit.

2. PROPOSED SYSTEM

The following figure shows the system architecture and flow chart of this project.



Block Diagram of Proposed System



Flow chart of Proposed System

3. WORKING METHODOLOGY

In this system uses two circuits.

1. Transmitting circuit
2. Receiver circuit

The system makes use of heart beat sensor to find out the current heart beat level and display it on the LCD screen. The transmitting circuit includes AVR family microcontroller interfaced to LCD screen and this transmitting circuit is powered by 12V transformer. Similarly, the receiving circuit includes AVR family microcontroller and RF receiver and also has a 12V transformer. The receiver circuit also includes LED light and a buzzer which are used to alert the person supervising the heartbeat rate of the patient and turns on the LED light and buzzer as soon as the heartbeat level of the patient does not fall within the normal heart beat level set. Now we make this system universal for all the hospital rooms. Operator can seat in single place and able to monitor all the patients.

The sensor shines a light lobe (a small very bright LED) through the ear and measures the light that gets transmitted to the Light Dependent Resistor. amplified signal gets inverted and filtered, in the Circuit. In order to calculate the heart rate based on the blood flow to the fingertip, a heart-rate sensor is assembled with the help of LM358 OP-AMP for monitoring the heartbeat pulses. When System powered On IR Tx starts emitting Light with 100% intensity towards blood cells. Light reflect back to Rx with " 100% - x " from it.

This 'x' value is our Heart beat rate. All data will send directly to server room so in case of any emergency fast action can be perform. A Heartbeat sensor is a monitoring device that allows one to measure his or her heart rate in real time or record the heart rate for later study. It provides a simple way to study the heart function. When the sensor is working, the beat LED flashes in units on with each heartbeat. This digital output can be connected to the microcontroller directly to measure the Beats per Minute (BPM) rate. Temperature sensor is analogue quantity with the range 0-135 degree. All the data can detected by sensor and give display which is LCD of 16*2. Simultaneously we these data goes on server and display on control room. We make this system universal for all the hospital rooms. Operator can seat in single place and able to monitor all the patients.

4. COMPONENTS REQUIRED

4.1 Heart Beat sensor



Fig-1:Heart beat sensor

Heart beat sensor is used to measure the pulse rate of heart in digital output.LED is used to detect the heart rate. The normal heart beat range is 78 bpm. This provides a direct output digital signal .

4.2 Temperature sensor



Fig-2: Temperature sensor

LM35 sensor is used to measure the temperature of the human body. The LM35-series devices are precision

integrated-circuit temperature sensors, with an output voltage linearly proportional to the Centigrade temperature.

4.3 Pressure Sensor



Fig-3: Pressure sensor

The Pressure sensor is used to measure the systolic and the diastolic pressure level using the device. It is measured in millimeter mercury (mmHg). Blood pressure changes from minute to minute.

4.4 Wifi Module :-



Fig-4 WIFI Module

The ESP8266 WiFi Module is a self contained SOC with integrated TCP/IP protocol stack that can give any microcontroller access to your WiFi network. The ESP8266 is capable of either hosting an application or offloading all Wi-Fi networking functions from another application processor.

4.5 Atmega 328 :-

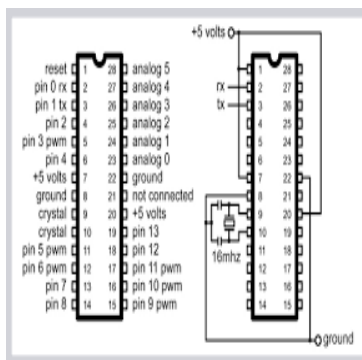


Fig-5 Atmega 328

Atmega 328 is an eight (8) bit micro-controller. It can handle the data sized of up to eight (8) bits. It is an AVR based micro-controller. Its built in internal memory is around 32KB. It operates ranging from 3.3V to 5V. It has an ability to store the data even when the electrical supply is removed from its biasing terminals.

5. ADVANTAGES

- Portable system
- Save risk of heart attack as you can check it in home
- Affordable system
- Temperature and Heart beat monitoring by single device
- All Patient monitored by single person seating in Server room.
- This system also helps for Hospital monitoring system.

6. CONCLUSIONS

Now a days we have an increased risk of heart attacks. This system which helps to detect heart rate of person using heart beat sensing even if person is at home. This system also helps for hospital monitoring system, all patient monitored by single person in server room. This system which helps to measure body temperature, heartbeat, pulses of person. we will make this system for animals so we can save them. If this technology will developed then we can detect heart blockage through this technology by our project.

REFERENCES

- [1] Internet of things: internet of things, https://en.wikipedia.org/wiki/internet_of_things.
- [2] Effective Ways to Use Internet of Things in the field of Medical and Smart Health Care: Kaleem ullah, Munam ali Shah, Sijing zhang, IEEE Journal 2016.
- [3] Heartbeat Monitoring and heart attack detection, Mamidi manisha , Katakann neeraja, International Journal of Innovations in Engineering and Technology(IJJET).
- [4] Heartbeat Sensing and Heart Attack Detection using Internet of Things, International Journal of Engineering Science and Computing(IJESC).
- [5] Heart Rate monitoring And Heart Attack Detection Using Wearable Device, International Journal of Technical Research and Application(IJTIRA).
- [6] Mobile based Home Automation using Internet of Things(IOT),Kumar Mandula, Ram Parupalli, E.Magesh,2015 International Conference on Control, Instrumentation, Communication and Computational Technologies(ICCICT).
- [7] <http://www.thehealthsite.com/diseases-conditions/heart-disease-in-india-6-shocking-should-known/>
- [8] http://ieeexplore.ieee.org/xpl/articleDetails.jsp?arnumber=4561963&queryText=heart%20attack%20sensor&news_earch=true

BIOGRAPHIES



Dr.A.A.Gurjar is working as an renowned Professor, Department of Electronics and Telecommunication, Sipna College of Engineering and Technology Amravati, India. He has completed his Ph.D.



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