Heart Attack Monitoring by Sensing Heartbeat Using IoT

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Abstract

Three heart attacks can kill a person but ia heart attack can kill a person first time it strikes. If we check our heart daily, we can identify this disease early. Life is precious. Many people around us lose their life because of heart disease. The factors which cause heart attack are less physical work, unhealthy diet, and age. To minimize the impact of this disease on our society, we are developing an arrangement which can reduce deaths caused by heart attack and we can also find whether a person is suffering from heart problems or not. The recommended system is a heart attack checker which will tell whether a person is having a heart attack or not and we are doing this with the help of IoT. The sensors which are inside the system are joined to the controller that helps in checking the heat rate and sending the result to the internet.

The user sets the bar of the heartbeat of the patient as high or low. After this he starts measuring the heartbeat of the patient. The device sends an alarm to the user when the heartbeat crosses the bar of high or low. For doing this work our arrangement has two parts. First part is the sending part which is present in the patient and the other part is the receiving part which is present in the office of the doctor. The arrangement uses a heartbeat sensor to know the level of the heartbeat of the patient and displays the result on the monitor of the room.

Keywords : ECG, heartbeat disclosure, heartbeat sensing, heartbeat sensor, IoT.

I. INTRODUCTION

The arrangement can measure the heartbeat, pressure, and temperature of the person by using different sensors on a regular basis. It is in the hands of the doctor to set the minimum level for heartbeat, pressure etc. After checking all the parameters, the arrangement calculates the limit. If it crosses the limit, it will send an alarm to the server that there is an emergency.

In the modern age of communication and technology, the explosive growth of electronic devices, wired or wireless has now become one of the most important aspect of the life of people.

The emerging era of the connected world is of the IoT which helps to join sensors, plugins, and many other things like combinations of sensors, and mobile phones. With IoT, we can combine multiple kinds of devices, and we can access data and devices from any part of this world.

The main goal of IoT is to maximize utilization of the internet with remote control, access to various data and machines, and sharing the data with others.

With the help of sensors, any device which is present locally or remotely can be fixed because the ability of the sensor to send the data in 24x7.

The term IoT was first used by Kevin Asthon in 1999. IoT technology can help us access a huge volume of data from various things. Combining the internet with the IoT, which works on low costs sensors and Wi-Fi, large number of services can be provided.

II. PROPOSED SYSTEM

The system uses a power supply unit. There are different sensors such as heartbeat sensor which takes measurement of the heart beat, and pressure sensor which takes measurement of pressure in the body, and a temperature sensor which takes the temperature of the body.

After taking all the data from the body with the help of

Manuscript Received: October 8, 2019; Revised: October 17, 2019; Accepted: October 19, 2019. Date of Publication: December 5, 2019.

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DOI: 10.17010/ijcs/2019/v4/i6/150424

sensors, it sends all these data to the controller part which does some calculation after which it will send the result to the monitors of both the patient and the doctor. It will also send one copy of the report to the server through which it can be accessed whenever it is needed by the doctor. Fig. 1. and Fig. 2. show the block diagram and flowchart respectively of the recommended system .

III. WORKING TECHNIQUE

The system has two parts : (a) sending part, and (b) receiving part.

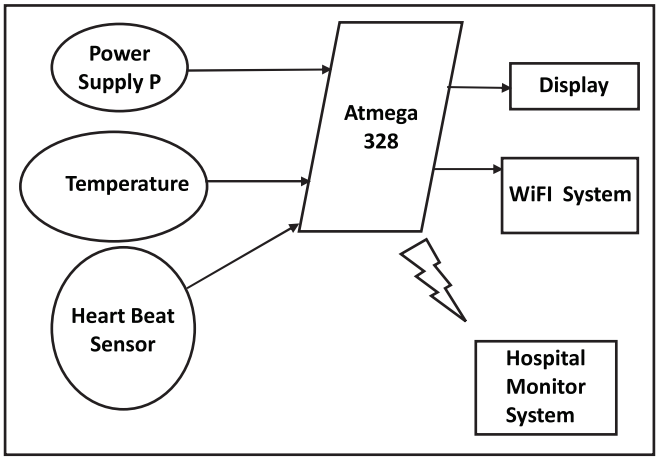

Fig. 1. Block Diagram of the Recommended System

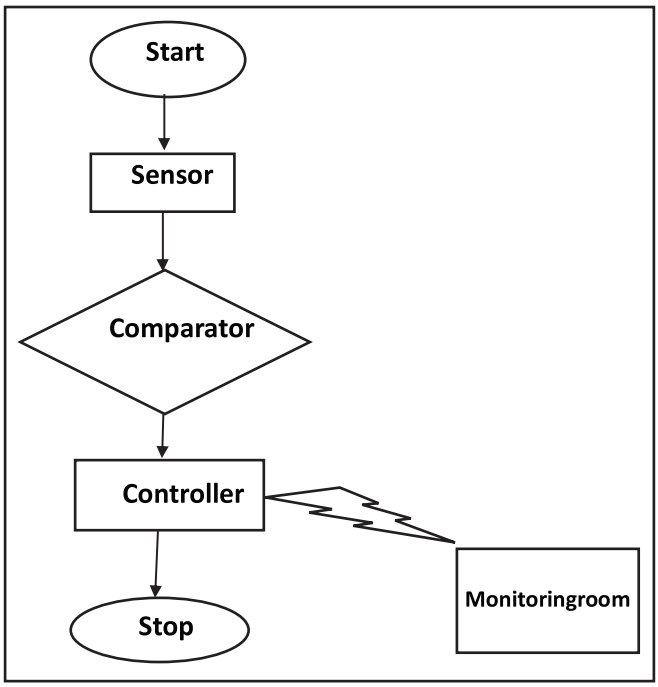

Fig. 2. Flow chart of the Recommended System

It has a heartbeat sensor which measures the heartbeat rate and sends the result to the monitor as well as to the server. The sending part is the combination of the controller and sensors which calculate the heartbeat and sends it to the monitor and to the server. The sending part gets power with the help of a transformer present in the system. It supplies a power of 12 V to the system.

On the other side, the receiving part also has all the components like the sending part, but in addition it has a monitor, light, and one alarm part, which blinks and alerts the doctor and his team when the heartbeat rate of the patient either goes above or below the limit which is set by the doctor.

We are trying to develop a common system for all the patients so that the doctor and his team can sit in a single room and manage all the patients. The sensor sends the signals with the help of the ear of the patient and then the measurements are sent to the patient with the help of the LDR. To find the current heart beat rate of the patient with the help of blood flow which flows in the fingertip, the sensor is combined with the LM35AP sensor for measuring the current heartbeat level.

When the system gets power from the transformer, the IR part sends a light of 100% intensity towards the blood. Then the light is sent to the RX with the value of 100-X where X is the current value of the heartbeat. After doing all the calculations on all the collected data, the analysis is sent to the server of the hospital so that corrective action can be taken by the doctor and his or her team in case of emergency.

A heartbeat sensor is a device which is used to measure the current status of the heartbeat and can be used later by recording it if required. It acts as a simple way to understand the functionality of the heart.

When the system is working correctly, it calculates the heartbeat and sends the output to the monitor. The output which we get with the help of sensors can be combined with the controller and can directly calculate the BPM (beats per minute) of the body. Temperature sensors are used to check the temperature of the body. All the data received from the sensors is shown on the monitor and the data are also sent to servers through which the data can be used by any authorized person any time.

Thus, one doctor can monitor as well as manage all patients at one time because he is getting all the information related to all the patients at the same time .

IV. WORKING OF THE SYSTEM USING FLOW CHART

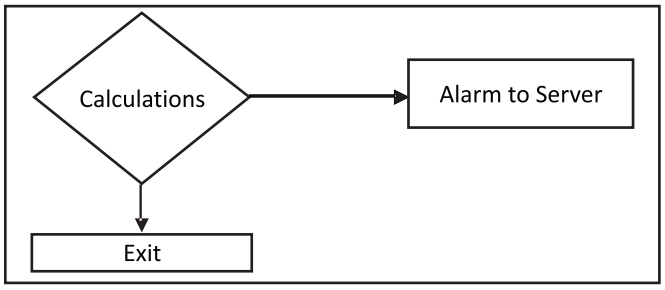

Fig. 3.Working Technique

Fig. 3. shows the working of the system. The process starts when the system gets powered on. The sensor takes the input from the blood as temperature from the hand and pressure from the blood and after this it sends the input to the controller where the actual calculations are done. After thisthe result is sent to the server.

If the parameters are normal, the same process is repeated otherwise the alarm is sent to the server of the doctor as well as to the monitor of the patient so that the doctor can take immediate action.

V. PARTS NEEDED

(1) Heartbeat Sensor

This sensor is used to measure the heartbeat rate of the person and its output in digital form (Fig. 4.). Light emitting diode is used by these sensors to check the heartbeat rate of the person. A normal heartbeat rate of a person in 78 bpm. It can be measured as a direct output in the form of digital signals.

(2) Temperature Sensor

This sensor is used to measure the temperature of the body (Fig. 5.). These devices have absolute integrated circuit sensors which give voltage which is equal to celsius. These sensors come from the family of LM35 sensors.

Fig. 4. Heartbeat Sensor

Fig. 5. Temperature Sensor

(3) Pressure Sensor

This sensor is used to measure the systolic and diastolic pressure of the body (Fig. 6.) . It measures the pressure in mmHg. Blood pressure can be different from time to time.

Fig. 6. Pressure Sensor

(4) Wi-Fi Unit

This unit is a soc with the TCP/IP stack that gives the controller the ability to take control of Wi-Fi networks (Fig. 7). It has the ability of blocking all networking functions from other systems. It comes from the family of ESP8266.

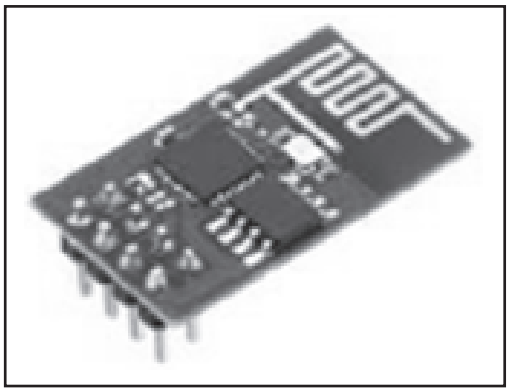

Fig. 7. WiFi Module

(5) Atmega 328

Atmega 328 is an 8-bit controller (Fig. 8). It can control and manage 8 bitdata. It works on AVR technology and has 64KB memory. It works on 3.5 V to 5 V. It has the ability to store data even when the system is turned off.

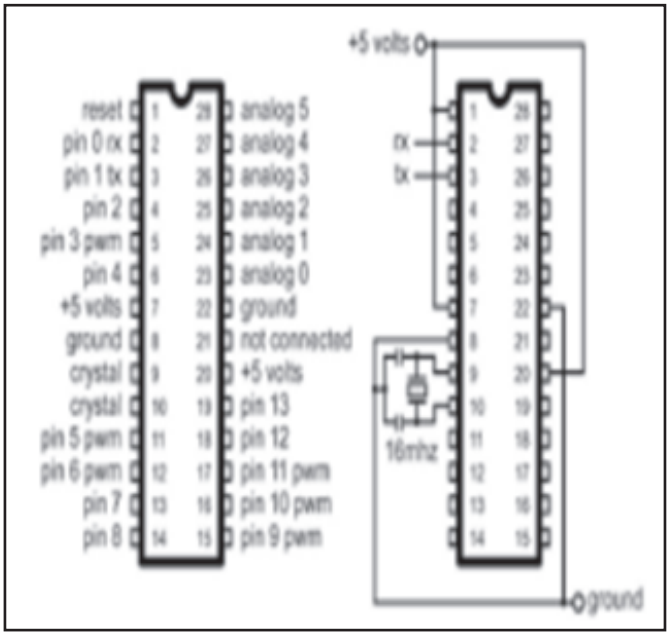

Fig. 8. Atmega 328

VI. ADVANTAGES

1. It is a portable system which can be taken to any place very easily.
2. It is effective is monitoring chances of heart attack as heartbeat rate can be checked anywhere and anytime.
3. With the help of this system we can easily check the temperature, pressure, heartbeat of any person using a single device.
4. With the help of this system a doctor sitting in one room can manage all his patients.
5. The system also helps is managing activities of the hospital.

VII. CONCLUSION

The chances of heart attack have increased many a times today. This system helps people identify the heart beat rate with the help of sensors anywhere. It also helps in managing and monitoring people in a hospital, which implies that a single doctor can manage all his patients remotely.

This system helps in knowing not only the heart beat, but the temperature of the body as well as the pressure and pulse rate of the body of any person.

This system can be developed not only for humans but also for animals, so that we can save them and if this technology gets developed in the future, we can easily find whether our heart is working properly or not. If not, we can take treatment early.

REFERENCES

[1] "Internet of things." [Online]. Available: https://en.wikipedia.org/wiki/internet_of_things

[2] K. Ullah, M. A. Shah, and S. Zhang, "Effective ways to use internet of things in the field of medical and smart health care," in *2016 Int. Conf. on Intelligent Syst. Eng*. Doi: 10.1109/INTELSE.2016.7475151

[3] M. Manisha and K. Neeraja, "Heartbeat monitoring and heart attack detection," *Int. J. of Innovations in Eng. and Technol.*

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