

Employee's Health Monitoring System using IoT

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Abstract: Health monitoring system using Internet of things describes the collection and interoperation of employee data collected from the sensors. The collected sensor data will support in the emergency situation for betterment and improvement of the employee health. The proposed work will help to know about the status of patient health to monitor anywhere in the world. The sensors gather the medical information of the patient that includes patients body temperature, heartrate, blood pressure and ECG. The patient close relatives or friends can monitor data from any place of the world through the message received in case of emergency or abnormality.

Keywords: Internet of Things, Sensors, Heartbeat, Blood pressure, Temperature, ECG.

1. Introduction

The development of technologies changing human life into a new level. Internet of things is one of the rising topic of social, economic and technical significance and plays a major role in health care. The proposed work monitors health parameters of an employee using Raspberry pi.

Raspberry pi is a processor used in many IOT applications and it works on a linux platform. Raspberry pi provides access to the on-chip hardware i.e. GPIOs for developing an application. By accessing GPIO, we can connect devices like LED, motors, sensors etc. and can control them too.

Now-a-days in every organization employee are constantly facing several health problems due to work stress. These health issues leads to several problems which has to be taken care by the organization. The health issues can be regularly monitored to avoid future problems. In this paper we are designing a system that helps the organization to provide a health check-up facility to their employees while entering the organization. The system monitors health parameters such as body temperature, heart rate, blood pressure and ECG. If the value of any parameter does not match with the normal range, then message will be sent to a concerned family member. The values of these parameters are stored in a cloud for future use.

2. Literature Survey

1. Survey paper 1

Name of the author: U. Sai Nishita

Year: 2018

Title: Health care monitoring and accident tracking system based on location awareness.

Description: The processed values are recorded online and stored in the cloud database like Thingspeak and can be accessed through any mobile or computer. The system is more useful in transport departments.

2. Survey paper 2

Name of the author: Chetan T. Kasundra

Year: 2013

Title: Raspberry-pi based health monitoring system

Description: To assess the physical health of an individual, the system uses heart rate variability analysis in time and frequency domains. Acquired data are first stored, analyze and visualize on a server. Results of the analysis are then automatically sent to mobile devices carried by the individual or appointed healthcare providers or other mobile devices through e-mail.

3. Survey paper 3

Name of the author: R. Kumar

Year: 2010

Title: Raspberry pi based patient health status observing method using internet of things

Description: In this paper patient's health parameters are monitored using raspberry pi. After connecting internet to the raspberry pi board it acts as a server. Then the server automatically sends data to the webserver and then these parameters are monitored using webpage anywhere in the world using laptops, smart phone. If these parameters exceed the threshold, it will automatically send alert message to the doctor.

3. Methodology

The system is designed to measure the health parameters like body temperature, heartbeat, blood pressure and ECG of an employee.

The system architecture is illustrated in the above figure. Raspberry pi is the main heart of the system and all the sensors are connected to it. The hardware components which are used here are temperature sensor, heart beat sensor, blood pressure sensor and ECG sensor.

Temperature sensor is used to measure the degree of hotness.

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Here we used LM35 IC temperature sensor which can read the temperature between -55 to 150 degree Celsius. MAX30100 oximeter sensor is used to measure the blood pressure and number of heart beats per minute. AD8232 ECG sensor detects the abnormalities in the heart.

The data collected from the sensors are sent to raspberry pi for further processing and data is stored in the cloud. In case of emergency message will be sent to concerned family member.

Doctors can make use of this data for better understanding of employee health status. The data can be accessed from any place of the world using the password given to each employee.

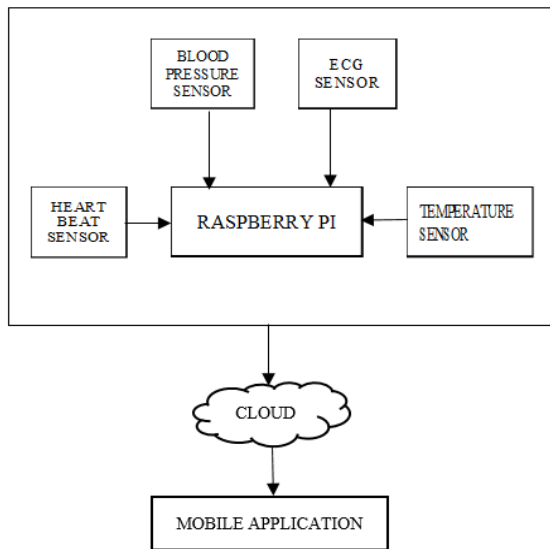


Fig. 1. Block diagram of health monitoring system

4. Implementation

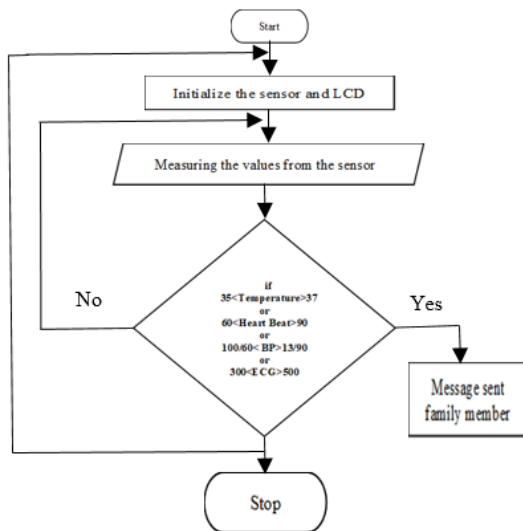


Fig. 2. Flow chart of the proposed system

Flowchart of the proposed system is shown in the above figure. The implementation starts with initializing the sensors and LCD. Health parameters such as body temperature, heartbeat, blood pressure and ECG are measured using sensors and displayed on LCD. The normal temperature should be between 35 to 37 degree Celsius. The number of heart beats per

minute should be between 60 to 90 and blood pressure varies between 90/60 to 130/80 mmHg. The normal digital ECG value varies from 300 to 500. If any of these condition fails, then it is considered as abnormal case and the message will be sent to a concerned family member. Otherwise, the loop starts from the beginning.

5. Results

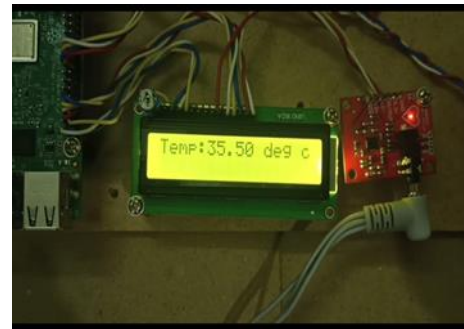


Fig. 3. LCD displaying temperature of 35.5 degree Celsius

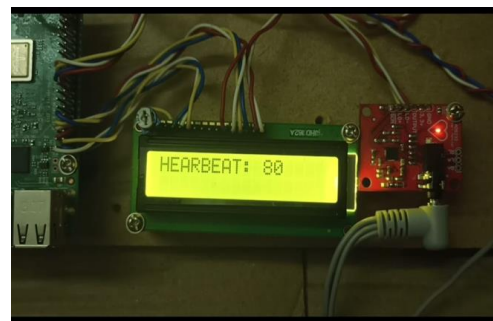


Fig. 4. LCD displaying heart beat as 80 bpm

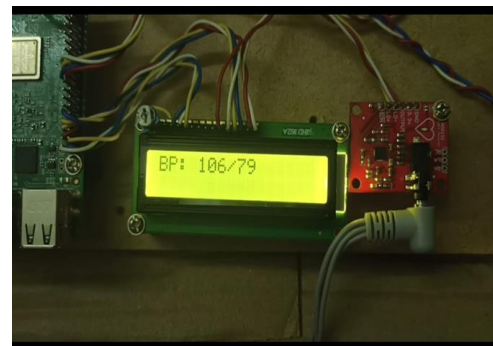


Fig. 5. LCD displaying blood pressure as 106/79 mmHg

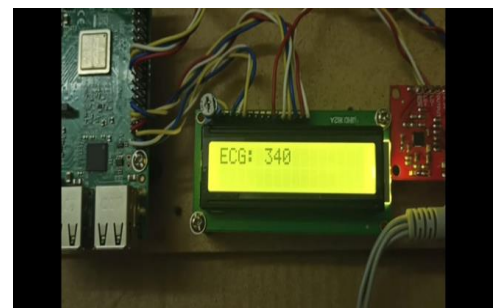


Fig. 6. LCD displaying ECG as 340

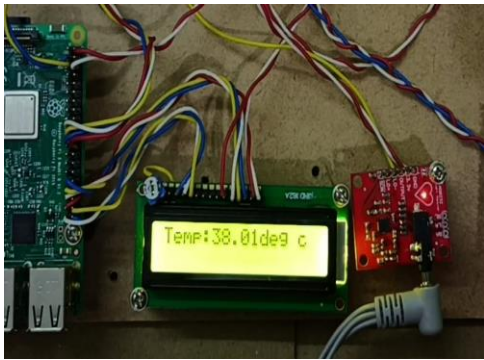


Fig. 7. LCD displaying temperature as 38.01 degree Celsius (condition of more temperature)

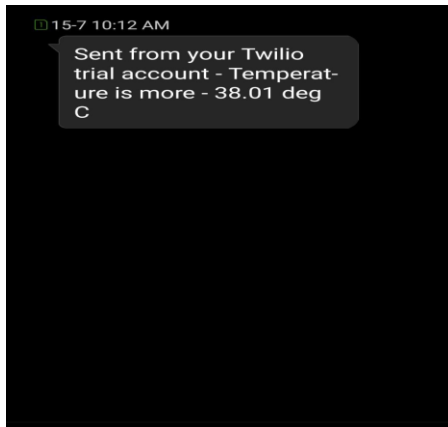


Fig. 8. LCD displaying the message sent to family member

6. Conclusion

The proposed system facilitates the health parameters of an individual employee and it is stored inside the cloud. The body temperature, heartbeat, blood pressure and ECG values are monitored by the system using sensors and displayed on the LCD. In case of emergency or abnormality, the message will be sent to concerned family member.

7. Future Scope

- In future, the work can be further developed to track the patient location using GPS and GSM.
- Other health parameters can be included in the work.

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