

Smart Health Monitoring System using Sensors

Mr. Suhas Pindiprolu, Mr. Harshal Marathe,
Ms. Rakhi Mallesh
Trinity College of Engineering and Research
University of Pune, India
suhpin95@gmail.com
deadecho47@gmail.com
malleshrakhi@gmail.com

Ms. Shubhada Palase, Prof. Pavan Kulkarni
Trinity College of Engineering and Research
University of Pune, India
shubhadapalase@gmail.com
pavanscs012@gmail.com

Abstract— In real life, we have to constantly monitor the patient. As of now there is no automatic alerting system has not been implemented which will notify a helper or relative a patient who is at a remote location. In this project, we monitor pulse rate, temperature and generate ECG with the help of sensor. Sensors sense the records the value and sends those to android phone . In case of emergency, message is sent to the patients relative. And also the appointments at the hospital will be reminded to the patient. The focus of the project is to build an android platform based application, which uses the idea of IOT. Moreover, we present a prototype of a basic health-care monitoring system, which alerts, in real time patients relative that an elderly people has experienced a problem that could need medical attention or hospitalization.

Keywords-*lot, android, ecg, soc, rpi, firebase.*

I. INTRODUCTION

The Internet of things (IoT) is the large network of devices, vehicles, appliances which are used in home, and the embedded devices with network connectivity enable connection and exchange data. Internet infrastructure helps in identifying the devices uniquely and can inter-operate with other devices in the infrastructure.

Remote sensing of the devices and direct interaction with them across the network infrastructure is quite possible because of the IoT and resulting in accuracy, economy in addition to reduced human intervention. We would be using the concept of IOT in Health-care and with the help of cloud would be storing and accessing the data. Devices collect the data and then helps in sharing of data with the available technology autonomously. Large amount of data is being generated due to increase in internet connected devices, and thereby improving the performance of the system.

II. LITERATURE SURVEY

Paper 1: IoT consists of a large number of small devices coupled with one or more sensors, some processing circuits, and a wireless transceiver. These devices are termed as sensor nodes or motes. Patients body temperature, heart beat are monitored and sent to doctor in remote location. This system applies only for remote places such as inside of a hospital or a building.

Paper 2: Possibility of sharing the real time data and heterogeneous data is quite possible because of the advancement in IoT. But this has increased the challenge of managing the real time data. In this research, first a semantic

data model is proposed to store and interpret IoT data. Then acquire ubiquitous data and process it. Then use the knowledge and apply the same for medical service Paper 3: In this paper novel method to utilize it IoT within the field of scientific and crafty wellness care are presented. This paper describes and proposes monitoring with the help of RFID tags using IoT Technology. Various Emergency test cases have been experimented and it has been proven that its very efficient. Combination of micro-controller is presented so as to get the efficient results in this system.

Paper 4: A Body Sensor Network is designed to operate autonomously to connect the various medical sensors and implants located inside or outside of the human body, which helps in flexible operation. It is also cost saving option to both health-care professionals and patients. This work illustrates the design and implementation of a smart health monitoring system. Here set of wearable sensors are used for real time sensing and collecting the patients parameter which later on will be shared with other devices.

III. WORKING

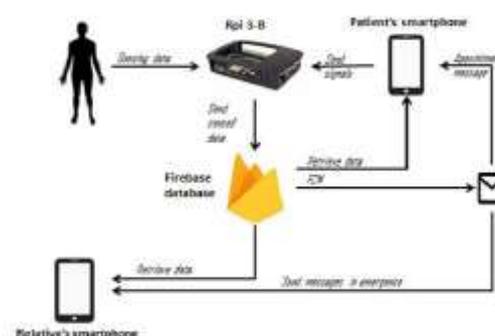


Figure 1

Figure 1 shows the working of the proposed project. Here there is communication between Raspberry pi(rpi), android device and firebase database. Following are the flow in which the communication is done

- First step is to initialize the Rpi and android app and connect both device using Bluetooth.
- After the connection is done, the user can initialize the sensor when the sensors are connected to the body to start sensing data.
- The sensed data is send to firebase and the user retrieves the data through firebase .
- Here they are mainly two types of user:-
 - 1)Patient - The users who are using the sensors and is checking the sensed data.
 - 2)Relative/others - The users who are checking patient user data.
- For relative user able to access patient user data, the relative user contact must be entered in patient user's relatives field.
- The firebase also analyze the data and checks whether the threshold values are met.
- If the threshold are not met then it sends notification to relatives.
- The app also features setting reminder for doctor's appointment.

IV. APPROACHES

Various approaches have been used in the previous years to implement health-care monitoring system. In the initial stages, the main focus was on hardware.

Software provides a Graphical User Interface which is an easy way of interaction with the user. Different Interfaces like mobile applications and web based applications enables the users to communicate with the hardware and to control them. So Patient can monitor various parameters such as ECG, pulse rate, temperature with the help of smart phones. Numerous types of sensors like ECG sensors, pulse rate sensors and Temperature sensors are used for monitoring health. Electronic development kits like Arduino and Raspberry Pi provides power and instructions to other devices in the entire setup. There should be proper communication of devices within the network infrastructure.

Firestore: Firestore is a backend technology that is owned by Google. INC which is used for running web applications. It is NO-SQL database. It provides various services that are useful for making an app cloud ready. Building app and managing app becomes very easy using firestore. Various API makes use of firestore. It is very useful for developer as developer need not to care about the functions of cloud as this API's makes work easy.

Storage server: We can use a server that is used to store, access, secure and manage data, files and services. A server is used for storing and accessing small to large amount of data

over a shared network or through the internet. Storage server can also be called as file server.

Web Application: We can create responsive web applications so that we can use it on mobile as well as on personal computers for communicating with raspberry pi for measuring body parameters using different sensors. For creating web applications we can use Javascript, HTML, CSS, React, Material design, etc.

Mobile application: We can create mobile apps using different platforms like Android, IOS using languages like Android (java) and swift respectively. We can create applications in such a way that they can be used to communicate with raspberry that can be used for sensing different body parameters using different sensors.

V. CONCLUSION

Here we conclude that sensors with the interconnection of micro-controller/S.O.C will help to build an environment where it would be possible to monitor patient's body parameter. It will ensure safety of patient and help in keeping check of patient from remotest location.

VI. FUTURE SCOPE

Data Mining and Machine Learning Algorithms can be used to predict the disease or the condition through which the patient is suffering from, depending upon the recorded value.

The project can be further developed in future to detect exact heart rate with analysis.

A proposed system will extend the concept of tele-medicine which is use to provide the clinical health care from a distance. It will be beneficial for the study of wireless transmission of data of patients in case of emergency.

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