

HEALTH PAL: HEALTH MONITORING SYSTEM BASED ON IOT

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Abstract—this paper gives us the development of a microcontroller based system for wireless heartbeat and temperature monitoring using Wi-Fi module. By this we can easily provide real time information available for many users and can send them alert in critical conditions over internet. Many patients are dying because of heart attacks and other illness reason behind this factor is that they are not being provided with proper help during that particular period. It is important to provide them with immediate help by giving proper treatment by analysing their health conditions. This monitoring system can also be used when the patient is bedridden. Where, the similar systems which are only available in the hospitals in ICU are huge. The system is also developed for home use by patients that are not in a critical condition but need to be timely monitored by doctor or family. So that we can easily save many lives by providing them quick service. Health monitoring for active and assisted living is one of the paradigms that can use the IoT advantages to improve the patient's lifestyle. In this project, we have presented an IoT architecture customized for healthcare applications

Keywords— Heart rate Sensor, Temperature Sensor, So2 Sensor.

INTRODUCTION

Health monitoring is the major problem in today's world. Due to lack of proper health monitoring, patient suffer from serious health issues. In India many patients are dying because of heart attacks and reason behind this factor is that they are not getting proper help during the period. To give them timely and proper help first we want to continuous monitoring of patient health. Hospitals always need better management. A health monitoring system is an extension of a hospital medical system where a patient's vital body state can be monitored remotely. The database of all patients should be handy enough. But also, there should be data prevention. Also the patient data should be kept private in case. Improving the lives of patients especially in the weaker parts of the society which include the elderly, physically and mentally disabled as well as the chronically ill patients is the major factor to be improved. In existing system, pulse Oximeters and Blood Pressure monitors which is used to find Blood pressure and pulse rate in humans body, where the data is recorded in the form of paperwork or on general storage server.

Product overview:

Here in this project, we will make an IoT based Health Monitoring System which records the patient heart beat rate and body temperature. In the proposed system we present a health monitoring system that uses the sensors for collecting data from patients, intelligently predicts patient's health status and provides feedback to doctors through their devices having android application or web applications. The system uses Arduino NODE MCU as the main microcontroller. A temperature sensor and heartbeat sensor are connected to the Arduino NODE MCU. At cloud server, analytics is done and each patient is defined with unique address. So data at cloud can authenticate the right patient and provide the required request.

So with the IOT health monitoring, we can have the database of these changes in the health parameters. Doctors can take the reference of these changes or the history of the patient while suggesting the treatment or the medicines to the patient.

WORKING

We are proposing a new way where patient and doctors able to communicate through mobile application or web application.

Traditionally the detection systems were only found in hospitals and were characterized by huge and complex circuitry which required high

power consumption. Continuous advances in the semiconductor technology industry have led to sensors and microcontrollers that are smaller in size, faster in operation, low in power consumption and affordable in cost. In recent times, several systems have come up to address the issue of remote health monitoring. The systems have a wireless detection system that sends the sensor information wirelessly to a remote server

DEVICES USED

Heart rate sensor:

A **heart rate monitor** (HRM) is a personal monitoring device that allows one to measure/display heart rate in real time or record the heart rate for later study.

The flow of blood volume is decided by the rate of heart pulses and since light is absorbed by blood, the signal pulses are equivalent to the heart beat pulses. The MAX30100 is an integrated pulse oximeter and heart rate monitor sensor solution. It combines two LEDs, a photo detector, optimized optics, and lownoise analog signal processing to detect pulse oximeter and heart-rate signals. The MAX30100 operates from 1.8V and 3.3V power supplies and can be powered down through software with negligible standby current, permitting the power supply to remain connected at all times.



MAX30100 Heartbeat Sensor

Temperature sensor:

This sensor allows you to measure body temperature. It is of great medical importance to measure body temperature. The reason is that a number of diseases are accompanied by characteristic changes in body temperature. Likewise, the course of certain diseases can be monitored by measuring body temperature, and the efficiency of a treatment initiated can be evaluated by the physician.

The DS18B20 Digital Thermometer provides 9 to 12-bit (configurable) temperature readings which indicate the temperature of the device. The DS18B20 communicates over a 1-Wire bus that by definition requires only one data line (and ground) for communication with a central microprocessor. In addition, the DS18B20 can derive power directly from the data line ("parasite power"), eliminating the need for an external power supply. This sensor has been included in many applications such as Thermostatic Controls, Industrial Systems, Consumer Products, Thermometers, and Thermally Sensitive Systems.



DS18B20 Waterproof Temperature Sensor

CONCLUSION

The proposed system provides an inexpensive and efficient IOT based application for healthcare monitoring and tracking that can help in taking care of the patient's health by providing effective medical services at the right time. This system will thus be beneficial for both the patient and the doctor in case of medical emergencies. We come to the conclusion that our proposed system is truly based on cloud computing and IOT. The data is stored using cloud computing, this data can be stored permanently and it is accessible from anywhere. Another advantage of cloud computing is we can keep the update of patient in an emergency case, doctors and care takers can immediately interface with the patient and can take a serious action on patient and also can provide medication depending on health parameters. There is no need for doctors and care givers to be present there, they can interact with patient without their physical present. The system is able to automatically generate the graph of body changes as emergency SMS doctor gets.

So2 sensor

Sulphur Dioxide sensors designed to monitor this pungent odorous gas. Digital Gas Sensor Developer Kit for IoT.

Advantage

- 1) IOT Monitoring proves really helpful when we need to monitor & record and keep track of changes in the health parameters of the patient over the period of time. So with the IOT health monitoring, we can have the database of these changes in the health parameters.
- 2) Doctors can take the reference of these changes or the history of the patient while suggesting the treatment or the medicines to the patient.
- 3) Hospital stays are minimized due to Remote Patient Monitoring.
- 4) Hospital visits for normal routine checkups are minimized.

Disadvantages

1. The sensors are costly
2. If power supply fails circuit won't work

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