

Patient Health Monitoring and Alerting System Using Cloud

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Abstract

A healthcare becomes a big issue due to lack of availability. So, we are proposing a health care system which will be integrated with cloud computing. In this healthcare system consists of computing device and number of sensors mounted on patient's body. Medical Records of patients will play a beneficial role for patient's health improvement. This system will keep track of patient's health in a timely manner and generate the SMS alert when the patient's vital parameters crosses the normal value. The data will be transferred to the cloud storage that can be accessed by registered expert doctors via Android App. This system is use ful for doctor as well patient for better health care

Keywords- Healthcare, SMS, Cloud, Android, Mobile, Storage, MCU, EMR

I. INTRODUCTION

Cloud computing is a type of Internet-based computing that provides shared computer processing resources and data to computers and other devices on demand. It is a model for enabling ubiquitous, on-demand access to a shared pool of configurable computing resources (e.g., computer networks, servers, storage, applications and services), which can be rapidly provisioned and released with minimal management. "Thing Speak" is an open source Internet Of Things (IOT) application and API to store and retrieve data from things using the HTTP protocol over the Internet or via a Local Area Network. Thing Speak enables the creation of sensor logging applications, location tracking applications, and a social network of things with status updates.

The main focus of the method is to implement a prototype model for the real time patient monitoring system. The proposed method is used to measure the physical parameters like body temperature, heart beat rate, and other parameters with the help of sensors. Conventionally there are number of techniques available for the ICU patient's health monitoring system with wired communication technology. In this system the patient health is continuously monitored, and the acquired data is transmitted to wired or wireless sensor networks. The health sensor support for analyzing the input from the patient and the results of all the parameters are stored in the cloud database. In the cloud database both the patient details and the doctor details are stored. If any abnormality felt by the patient indications will send to the medical officials and as well the patients if they need to have any suggestions from the doctor, they can have it. The implementation of the system is achieved by PIC, node MCU and Android App.

II. LITERATURE SURVEY

Cloud computing: In Cloud Computing, the users use the web browsers as an interface, while the software and data are stored on the remote servers and hence it is device independent. EMR - electronic medical record (EMR) system by which the medical records are maintained in a centralized database

in the form of an electronic record and the records are stored in the cloud[1]

The sensors collect the patient vital parameters such as temperature and blood pressure, eye blink sensor. Heartbeat Sensor: This sensor monitors the heart rate. Temperature sensor: Its main application is detection of heat, so it is used as temperature sensor. The Eye Blink sensor is IR base: Eye blink sensor is used for post-operative patients or stroke patients who wants somebody's help immediately but cannot walk or lift hands or speak to draw attention of doctors or care takers. In such cases, the patient can blink his/her eye which is detected by eye blink sensor[2]

Presented a survey of about Cloud Based Healthcare Monitoring System for Hospital Management. The privacy of the electronic health data in mobile cloud computing environment is a serious issue that requires special considerations. Even presented a review on the technologies and approaches that are currently being used to deal with the important issue of healthcare monitoring system and mobile healthcare suggestion service. There are several challenges applied in cloud computing environment to the healthcare monitoring system and mobile healthcare suggestion service for hospital management[3]

The continuous monitoring of patient can be achieved by collecting the physiological information from various sensors, processing them using PIC microcontroller, transmitting the data through GSM and IoT module and storing the results in the internet you can access the data anywhere and there is no problem even you forgot any report while consulting a physician. He can access the details by typing the particular id given to the patient[4]

Proposes a framework for secure HealthCare Systems based on big data analytics in mobile cloud computing environment. The framework provides a high level of integration, interoperability, and sharing healthcare providers, patients and practitioners. The cloud permits a fast Internet access and sharing by authenticated users. Big data analytics helps analyze patient data to provide right intervention to the right patient at the right time. The proposed framework applies a set of security constraints and access control that guarantee integrity, confidentiality and privacy of medical data.[5]

Reviewed the current state and projected future directions for integration of remote health monitoring technologies into the clinical practice of medicine. We are able sensors, particularly those equipped with IoT intelligence, offer attractive options for enabling observation and recording of data in home and work environments, over much longer duration than are currently done at office and laboratory visits. This treasure trove of data, when analyzed and presented to physicians in easy-to-assimilate visualizations has the potential for radically improving health care and reducing costs. We highlighted several of the challenges in sensing, analytics, and visualization that need to be addressed before systems can be designed for seamless integration into clinical practice.[6]

Prototype model for smart health monitoring system that constantly monitors the patient health with the help of the sensors. This data is made available in the cloud through the real-time feed over the internet. The internet of things refers to uniquely identifiable objects and their virtual representations in an internet like structure. Internet of Things also referred to objects which connects "Any Thing, Any Time from Any Place" which will be very popular in the coming years.[7]

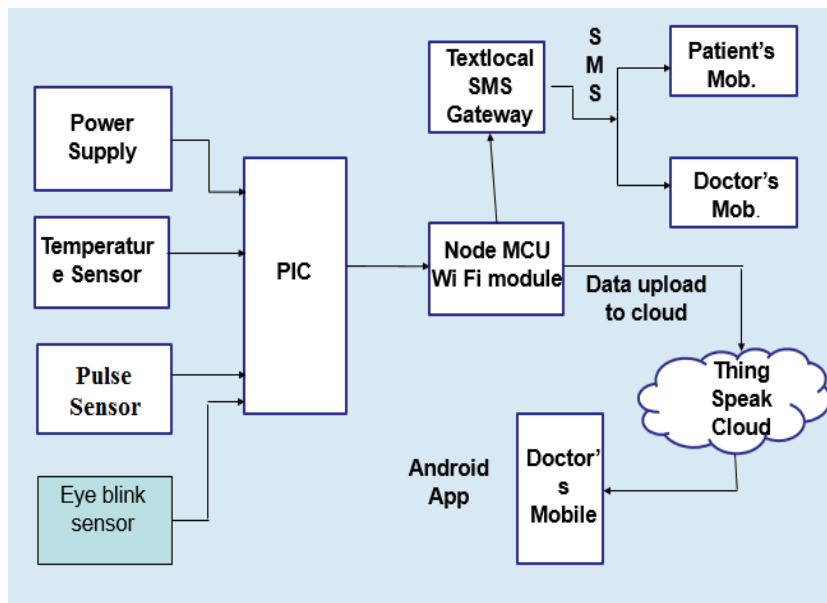
Attempts to comprehensively review the current research and development on wearable biosensor systems for health monitoring. A variety of system implementations are compared in an approach to identify the technological shortcomings of the current state-of-the-art in wearable biosensor solutions. An emphasis is given to multiparameter physiological sensing system designs, providing

reliable vital signs measurements and incorporating real-time decision support for early detection of symptoms or context awareness. In order to evaluate the maturity level of the top current achievements in wearable health-monitoring systems, a set of significant features, that best describe the functionality and the characteristics of these systems, has been selected to derive a thorough study.[8]

III. FRAMEWORK OF SYSTEM

Figure 1 shows block diagram and over view of the project.

Figure I. Block diagram of health monitoring System



The system is designed to monitor different parameter like body temperature, heartrate of patient and update this information on cloud. PIC controller is the brain of the system. We are going to use PIC18F4550 controller to which different sensors are connected and this data is sent to doctors mobile through cloud. Temperature Sensor LM35 is used to monitor body temperature of patient which gives output in analog form. Output of LM35 sensor is given to controller through in-built ADC.

PIC microcontroller has 13 channel ADCs so we can connect 13 analog inputs to PIC.

Heartbeat Sensor and eye blink sensor give output in digital form. So, we can connect these outputs directly to one of the port pins of controller. PIC Controller sends all this information regarding patient to NodeMCU.

NodeMCU is connected to PIC controller through serial communication. NodeMCU has inbuilt Wi-Fi through which we will get connected to internet and check parameters and if any parameter exceeds threshold value then SMS will be sent to doctors mobile and patient mobile. Also, this information is updated on cloud. Here we are using cloud provided by thingspeak which is an open source. Access to this cloud information is provided through read API key from which we can update information on Android App.

IV. RESULT

- 1) In emergency case it is very useful for doctors as well as patients.
- 2) It is expected that all sensors will show accurate values of each parameter.
- 3) Doctor gets SMS on the time so that they will handle patient quickly.

V. CONCLUSION

In this project we present a cloud based intelligent healthcare monitoring system which provides medical feedback to patient through cloud such as thingspeak or hospital. These sensors used in the system will begin giving adequate data related to patient's diseases.

VI. FUTURE SCOPE

It is very important in medical field. It provides large number of applications. It is very useful for doctors as well as patient's for healthcare.

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