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Intelligent Health Monitoring System

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Abstract: *The Internet of Things (IoT) techniques have overwhelming superiority in solving the problems of heart diseases attacks they can change the service mode into a pervasive way, and Cause a health care provision focused on the physical condition of patients rather than their feelings. A remote surveillance program is necessary for the realization of the universal healthcare service. The proposed system is a systemic IoT monitoring system that can send physical signs of patients in real time to remote cloud application. The device consists essentially of two parts: the data acquisition part and the data transmission part. The monitoring scheme (monitoring parameters and frequency for each parameter) Is the main point of the part of the data acquisition Multiple physical signs (blood pressure, ECG, Temperature, Heart rate and Mem's sensor(paralysis) as well as an environmental indicator with GPS (patients' location) are designed to be sampled at different rates continuously and send notification SMS to specific people using GSM. Four data transmission modes are presented taking risk, medical analysis needs, demands for communication and computing resources into consideration.*

Keywords: Health monitoring, GPS, Heart rate, Blood Pressure

I. INTRODUCTION

The Techniques of the Internet of Things (IoT) overwhelming superiority in solving the problems of heart diseases attacks they can change the service mode into a pervasive way, and trigger the healthcare service based on patients' physical status rather than their feelings [1]. In order to realize the pervasive healthcare service, a remote monitoring system is essential. The proposed system is a pervasive monitoring device which can take away physical signs from patients to remote cloud application in real time IoT [2]. The system is mainly consists of two parts: the data processing part and the data acquisition portion and the data transmission part. The monitoring scheme (monitoring parameters and For each parameter, and frequency) is the key point of the data acquisition part [3]. Multiple physical signs (blood pressure, ECG, Temperature, heart rate and Mem's sensor (Paralysis) as well as an environmental indicator with GPS (Location of patients). To be sampled at different locations Continuously rates and sends SMS notifications to specific people using GSM [4]. Four data transmission modes are presented taking risk, medical analysis needs, demands for communication and computing resources into consideration [5]. Finally, a sample prototype is undertaken to provide a system summary.

The Internet concept of things: The problem which has been described previously, Internet of Things (IoT) will provide an alternative solution, since the main characteristics of IoT is to provide spatially and temporally distributed data to users. The IoT is a concept based on the communication of sensors and actuators, which have been incorporated with physical objects and are linked to the Internet, to generate data, and allow acting on them. When objects will sense the environment and communicate through the internet, they will become tools for understanding; in this sense IoT is a tool for the compression of the environment [6].

Low cost monitoring alternatives along with a growing infrastructure due to its massive nature, which allows for developing a projects for monitoring purpose at low cost when compared with last decades [7].

II. METHODOLOGY

The proposed system is Pervasive monitoring system capable of sending out physical patients physical signs to remote cloud application in real time IoT. The system consists essentially of two components: data acquisition part and the data transmission part. The monitoring scheme (Feed and frequency control for each parameter) is the key point of

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the data acquisition part. Multiple physical signs (blood pressure, ECG, Temperature, heart rate and Mem's sensor (Paralysis) as well as an environmental Indicator with GPS (patients' location) are designed to be sampled at different rates continuously and send notification SMS to specific people using GSM. We have proposed health monitoring system includes patients, health monitoring unit, cloud for data storage and security guards with the help of certain hardware Units, various sensors, and internet devices. The system functionality is divided into three modules. Sensing, Main and Interaction.

- Sensing module is for sense the state of the patient.
- Main module is for collecting data via sensing module and for data storing into the cloud.
- And lastly is the user interacts with the system via interaction module.

A. Block Diagram

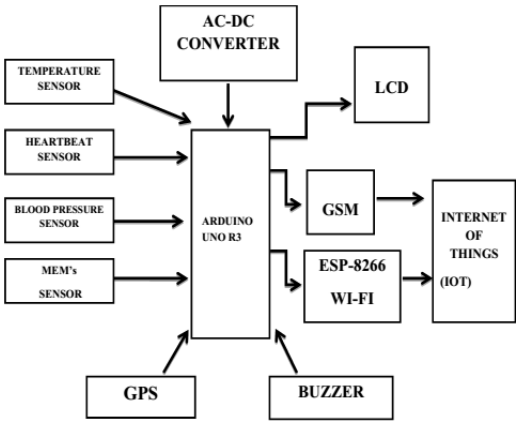

Figure 1: Block Diagram for Proposed System

B. Hardware Requirements

Arduino, Temperature Sensor, Heartbeat Sensor, BP Sensor, Mem's sensor, GPS Module, GSM Module, ESP-8266 Wi-Fi Module, Buzzer.

C. Software Requirements

- Arduino uno.

D. Flowchart

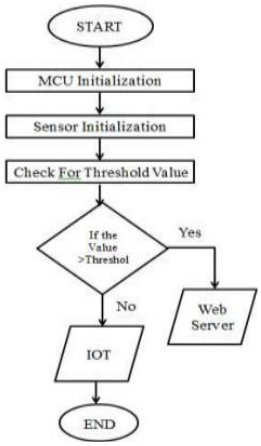

Figure 2: Flow Analysis of Sensors Operation

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E. Algorithm

Step 1:- Start

Step 2:- Initialization of MCU

Step 3:- Initialization of Sensors

Step 4:- Compare the Sensors Outputs to the standard values.

Step 5:- For Temp Sensor compare the patient's temperature with standard values. If it exceeds the standard values GOTO 9 Step otherwise store the values in Web server.

Step 6:- For BP Sensor compare the patient's blood pressure with standard values. If it exceeds the standard values GOTO 9 Step otherwise store the values in Web server.

Step 7:- For HB Sensor compare the patient's heart beat with standard values. If it exceeds the standard values GOTO 9 Step otherwise store the values in Web server.

Step 8:- For Mem Sensor compare the patient's heart beat with standard values. If it exceeds the standard values GOTO Step 9 otherwise store the values in Web server.

Step 9:- IOT, Which includes the setup of GSM Connection, Shares the GPS location to the hospital, update the values to the cloud, if any danger occurs the buzzer sounds an alarm to alert the patient.

Step 10:- END.

III. Testing and Results

We have also done manual testing in our system as stress testing to check the break point of the network. The manual testing was carried out with selenium tools while stress testing was done manually with the help of hundreds of nodes that were rented from an online server. The first testing was done on a channel to check whether it was able to feed the data i.e. whether the channel was able to receive updated data from sensors and it was able to update data in thingspeak cloud. The input was a updated data from sensors. The channel was found to be receiving the updated data from sensors and was updated in thingspeak successfully.

The entry was then tested to check if the method is able to create new entry to channel or to update a channel or to retrieve individual Elements from link feed. The entry was successfully in a rating new entry to channel and retrieving individual of elements from the sensors.

A. Classification of the sensor values

TEMPERATURE	HEART BEAT	CLASSIFICATION
29.81	77	NORMAL
29.81	77	NORMAL
30.79	154	NORMAL
30.79	154	NORMAL
31.78	35	ABNORMAL
31.76	35	ABNORMAL
31.78	63	NORMAL
31.76	63	NORMAL
30.30	14	ABNORMAL
30.30	175	NORMAL
30.30	175	NORMAL
30.30	70	ABNORMAL
30.30	70	ABNORMAL
30.30	308	NORMAL
30.30	308	NORMAL
32.25	56	ABNORMAL
32.25	56	ABNORMAL
30.30	70	ABNORMAL
30.30	70	ABNORMAL
30.79	77	ABNORMAL
30.79	77	ABNORMAL
31.28	0	ABNORMAL
30.79	0	ABNORMAL
31.28	40	ABNORMAL
28.34	0	ABNORMAL
28.83	0	ABNORMAL
28.83	0	ABNORMAL

Table 1: Classification of Sensor values

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Figure 3: Graph showing the Temperature sensor values in the Thing Speak Cloud

Figure 4: Graph showing the Heart Beat sensor values in the Thing Speak Cloud

IV. CONCLUSION

In this project we have taken a step to make it easier for old people and bedridden patients to get diagnosed continuously at cheaper prices and to alert the concerned persons immediately without the involvement of the patients. In the making of this project, we have learnt the various IoT techniques to develop a smart healthcare system, which make easier way to predict the condition. We are motivated to do the project that can be useful in the society.

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