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Smart Sense Healthcare Monitoring System Using Iota

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Abstract: Human health monitoring plays a vital role in healthy living in today's life. Monitoring the various parameters of a patient using the internet of things and Arduino UNO is the proposed system. In the Internet of things (IoT) the real-time parameters of a patient's health are sent to the cloud using Internet Activity. In GSM based patient monitoring, the health parameters are sent via SMS in case of an emergency, the patient health can be in Mobile Application at anytime and anywhere by many users so that it easier for accessibility of doctors and family members. One more benefit is that this data can be seen using a desktop computer, laptop, android phone, etc. Here the user needs an internet connection to view the data. The Mobile Application monitors the parameters and shows a graph for understanding. It includes a temperature sensor, heartbeat sensor, moisture sensor, position sensor to measure parameters and an ESP8266 Wi-Fi module to have the network.

Index terms: Health Monitoring, Internet of Things, Pulse Rate, Moisture, Position detection, Body Temperature, Android Application, Cloud

1. INTRODUCTION

Few years ago, no one predicted the immense impact of IoT in our daily life. Nowadays, the things have changed with the exponential growth of IoT sensor devices. IoT connects heterogeneous objects to the internet, which permit data exchange rapidly never exists before An IoT device that interconnects various types of objects wirelessly to a network and transmits data seamlessly and it is perceive as the "things" in IoT. Huge number of entities connected with the network in IoT based infrastructure that enables easy and effective communication. The embedded technology assists internal as well as external communication in order to make further decisions. The 'thing' in IoT can be an automobile with built-in-sensors or a human with a heart monitor. Once the objects are configured with IP addresses and are gathering and

transferring data with little or without any human Intervention. IoT devices include thermostats, light bulbs, door Locks, cars, fridges, wearable such as smart Clothes, smart watches, implantable like pacemakers. The IoT is all about functioning in concert of users in businesses, industry, or at home. The recent achievements in IT industry significantly improved the intelligence and communication and the devices with which we are interacting around. Healthcare Monitoring system plays a vital role as a dedicated ecosystem for medical treatment and supervision. It is obvious that the requirement of novel technologies is essential to permit the inter-communication between heterogeneous devices via internet. Healthcare and medical supervision services are used to change the entire world of innovative technologies. Various automation devices include intelligent sensors, regulators, actuators, PLCs exchanges data in order to direct control functionalities or monitor on a large-scalesystem.

The problem with the existing system is that the voice, infrared, and pulse data are collected

directly by the information acquisition boards and some of the live status of the elderly, such as whether he/she is absent or is sleep abnormally, is then be obtained easily. The live status whether the elderly falls down is obtained through video analysis by the main board. When all these live conditions are obtained, they are then uploaded to the server through Ethernet. Relatives can view the real-time status and historical status of the elderly with his/her mobile phone through a special installed app on it.Thus it provide delayed response and high cost. There is IOT interoperability barriers and security and privacy concerns when dealing with sensitive data. The main disadvantage of these systems is that they require installation of sensors in each room of the house, that are too intrusive and that are expensive.

Thus the Health care monitoring application target is to provide support for elderly people in terms of continuously monitoring their health and activity. With the help of IOT wearable's and indoor positioning technologies, applications are created to visualize data to Doctors, nurses and relatives and ensure peace of mind and quick action in case of emergencies.

2. METHODOLOGY

The sensors are placed in the targeted location within the human body and the data from those sensors are collected with the help of Arduino UNO as shown. The use of sensors like Pulse, Temperature, Moisture, Position Detection and then the WSN System is formed as shown. Taking the inputs from those locations with the help of Wi- Fi, then the monitoring is done in the Online Monitoring System which consists of Portable Main Station, Internet Gateway and Web Server & Database.

The design of sensor unit and control unit for human body measurement is shown in the best way. The Health Monitoring is shown in the Cloud Database. System Design

for Node MCU in the system is shown. The implementation of Health Monitoring helps in the determination based on the range of each parameters. The system that is described in the Figure. Shows the **monitoring, collecting and analysis of data even from far locations** with the use of **cloud storage.** The transmission of data from the controller takes place using the Node MCU Module.

Here, the data is transferred with the help of Node MCU which has an in-built Wi-Fi Module in it. The data sensed by the sensors are stored in the

Things peak Cloud Platform and the output is displayed in the Mobile Application.

The Monitoring systems available now a days are all of the separate modules that detect the values at one place and sends it the other location and then processing and analyzing takes place. They are all based on the detection of Heart Rate and Temperature, Moisture, Position of the Human bodies they take in as samples. They are Mobile-based applications and the output is mostly based on the values from the above- mentioned sensors.

3. WORKING

A. Monitoring Using Wearable Sensors

- This category includes small devices worn by the user able to detect the fall event when it occurs and to raise an immediate alarm.
- The technologies used are impact, position and tilt sensors, and accelerometers together with adequate control algorithms performed in a microcontroller.
- Sensors to monitor the Body Temperature, pulse rate, Moisture, Position is used with adequate micro controller.

B. Processing the Produced Data.

- The data produced by the sensors is fed to the cloud throughIo Tbrokers.
- IOT data is shared through the IoT data broker either for livedata-stream. Visualisation or for permanent storage using a dedicated database service that guarantees policy compliant access control.
- If the data value is beyond the threshold value, then the emergency receiver is stimulated.
- The central system that manages the emergency request. This system is composed of a GSM receiver binded with a Local Database.

C. Emergency Receiver

- The emergency receiver, which must be located strategically inside the user's home, which means that this device must be in central area of the house to have are

ception of the distress signal in all directions.

- It also must be close to a power outlet for its respective voltage supply and has to be located within an area where the reception of the cellular signal is high for not having any inconvenience at the moment where the messages are sent.
- A GPRS module based on SIM 900 was selected because most of the people in rural areas don't have access to Internet neither smart-phones, but they have access to GSM Network.

D. Displaying Analysis to the Owners and Doctors.

The software will be always running and it is designed with stability in mind so, it can process emergencies when necessary

.

- **SEND ALERTNOTIFICATIONS(SMS)**
- **Create and Store Alerts(Cloud)**
- **Enable external access to alerts(Web based access to cloud)**
- **Track and notify an alert status BLOCK DIAGRAM:**

a) Diagram representing the Doctor and the application request and responseflow.

4. IMPLEMENTATION:

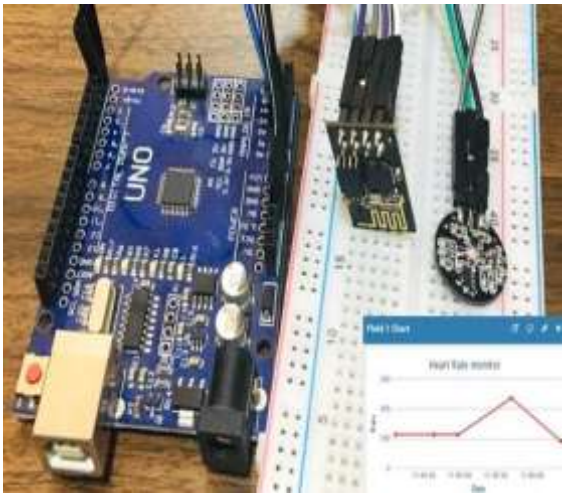
A Pulse sensor measures the He artrate produced by the human body, Temperature sensor measures the body temperature of a personnel, Moisture sensor measures the body moisture, position detector measures the body movement value is detected. To the Microcontroller, all the sensors are connected. The data using the sensors are fetched by the microcontroller and then passed to the Node MCU board which is connected with the Microcontroller. The Node MCU board helps the fetched data to be sent to the cloud server. In case of no Wi-Fi connection, then also has an inbuilt Wi-Fi module which sends the data to the Application anyway. The Application displays the Health Monitoring of a particular personnel.

The disadvantages mentioned above are overcome by the device the paper stated in such a way that the device that is designed in such a way the above figure shows. As the device is integrated all together as a single device the values once sensed are intimated immediately without any delay that shows that the proposed system is

developed using cloud computing technology which has a wide range of applications when compared to the traditional Bluetooth network.

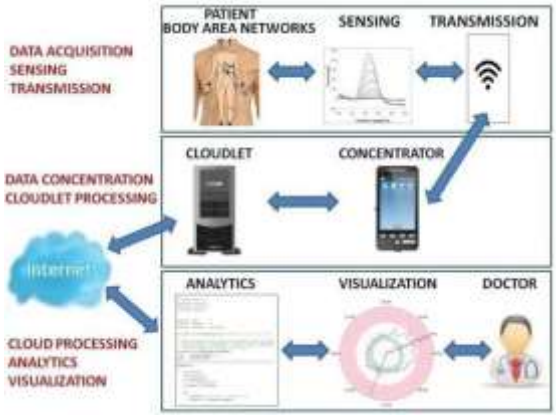
The database of the proposed system can be monitored by authenticated medic authorities from anywhere. This is useful when the personnel needs an emergency medical situation where he/she needs a medical backup. The device covers a larger distance rather than the traditional Bluetooth device.

The solution should support central monitoring of group of Personnel and also capable to transfer their individual Psycho-physiological data (like BP, Heart Rate etc.) to central location using cloud/any other technology. Security and privacy are very important aspects of this application, ensure appropriate standards are followed.



a) Diagram representing the Arduinoc ollecting data from the sensor.

b)



c) Schematic diagram of healthcare application.

5. CONCLUSION

The project can be used for the monitoring of health using appropriate sensors. This smart cloth helps in efficient tracking of data from sensors which then provide it to the cloud database. The user interface which can either be an android mobile application or laptop which provides the user with the required data. This health monitoring can be very helpful in emergency health situations where medical backup is required immediately.

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