

IoT Based Healthcare Monitoring System For Alzheimer Patients

1S Ilakya, 2T. V. P. Sundarajan
1PGscholar, 2Professor
Sri Shakthi Institute Of Engineering and Technology

Abstract - In this paper, the data's of Alzheimer patients are collected and also uses the sensors and send the data's to the server are stored in a database. And hence we have proposed our project to safeguard dementia patients from getting lag in their mental health by boost their memory power by often remaining the patient to do scheduled activities on time. Also our system continuously monitors their physical health and intimate them when they required any medical assistance. Additionally we have adopted accelerometer sensor which will identifies whether the patient is in fall zone and intimates them regarding the environment. In case of any emergency the caregivers or concern persons generate alerts immediately when they face the situations that are indiscernible. The real time IOT, webpage is created and the data's are secured by the security key ARDUINO UNO is used for analysis purpose and results are shown in a better and easy way. Finally we discuss about the wearable technology for the construction of sensor band.

I.INTRODUCTION

Alzheimer disease is a chronic, irreversible disease that affects he cells of the brain and causes impairment of intellectual functioning. It will cause a brain disorder which gradually destroys the ability to reason ,remember, imagine and learn. Wearable smart devices are increasing nowadays, instead of relying the observations of doctors the patients themselves can collect their health data and manage their process on single platform. Nowadays all the wearable devices are well equipped with diverse software and hardware and that are too expensive and are not targeting on personal data protection.

Internet of Things(IOT) has become most important in the field of the embedded, with the help of the IOT the remote access of any system can be easily achieved by using of the IOT the remote health monitoring system can be achieved.



Fig:1 Wireless Monitoring of the system using IOT system.

Some hospitals have begun implementing "smart beds" that can detect when they are occupied and when a patient is attempting to get up. It can also adjust itself to ensure appropriate pressure and support is applied to the patient without the manual interaction of nurses.

II.COMPONENTS AND BLOCK DIAGRAM

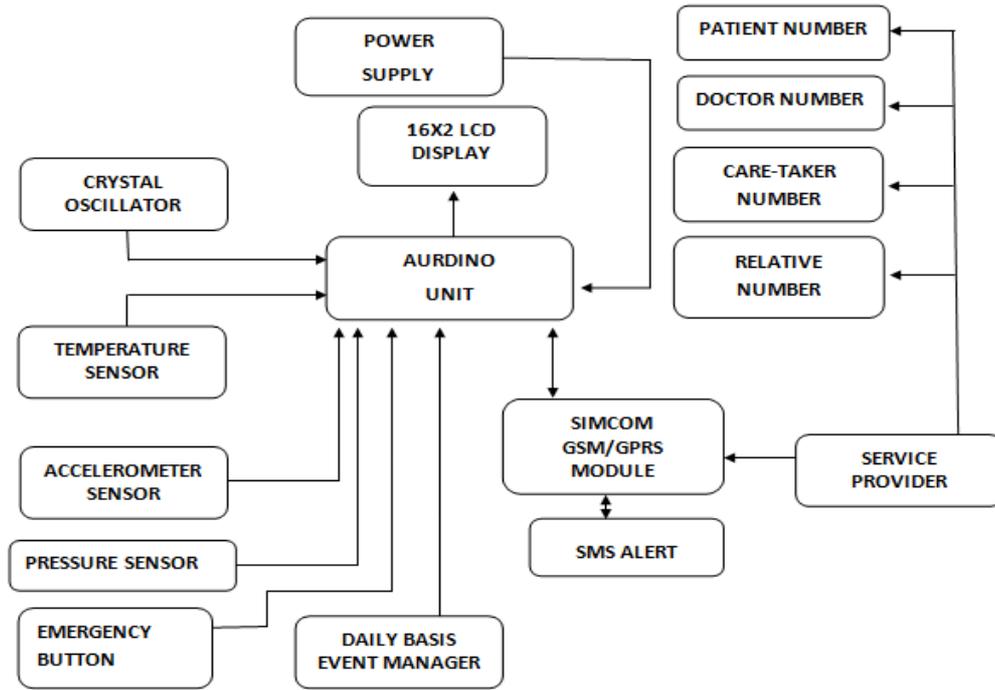


Fig:2 Block Diagram for health monitoring system of the Alzheimer

ARDUINO is used for this process of the monitoring process where the temperature sensor, pressure sensor, accelerometer sensor are used to take values from the Alzheimer patient where the values are continuously monitored, the sensors used in the project are attached to the patient wrist. Where those values are transmitted using the GSM module to the Doctor or the Monitoring person.

III.SYSTEM ARCHITECTURE

The system architecture comprises of the components the externally visible to those components, the components are

- 1.ARDUINO
- 2.Temperature sensor
- 3.Pressure sensor
- 4.Accelerometer sensor
- 5.GSM
- 6.LCD Display(16*2)
- 7.Service provider
- 8.Daily basis event provider

1.ARDUINO

ARDUINO is the open source microcontroller where Atmega 328 is the serial number it have the 14 digital input and output pins, 6 analog input pins, basically Arduino is basically the programmable device which is used to control the devices the inputs are basically read through the analog Pin and the digital Pin are used to display the output values.

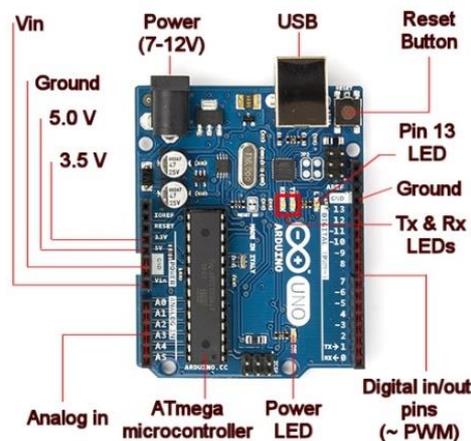


Fig:3 Pinout diagram of ARDUINO

2.Accelerometer

Accelerometer is basically the Micro-Electro-Mechanical device which is used to measure the acceleration in all the 3 axes basically MEMS consists of the micro sensors, micro actuators, microelectronics and micro structures all integrated onto the same silicon chip. A transducer is a device that transforms one form of signal or energy into another form. The term transducer can therefore be used to include both sensors and actuators and is the most generic and widely used term in MEMS. MEMS concept was basically found in the year 1950's and later 1958 silicon strain gauges are commercially available later 1995 BioMEMS rapidly develops and in 2000 MEMS optical-networking components become big business the basic MEMS diagram is shown in the fig:4

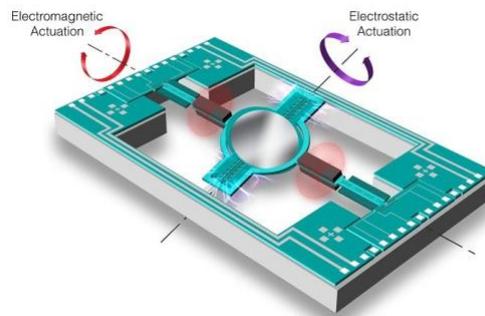


Fig:4 Basic Structure of MEMS system.

3. Temperature sensor

Temperature sensor is basically thermocouple or RTD where the value of temperature is given through an electrical signal basically the thermocouple consists of two dissimilar metals which produces electrical signal directly proportional to the change in temperature where temperature increases electrical signal increases.

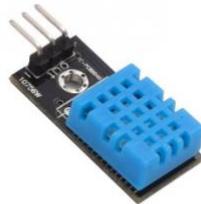


Fig:5 Temperature sensor

4. Pressure sensor

Pressure sensors are used basically to control the volumetric flow rates as well as the fluid rates where it is also used to control the blood pressure of the individual person (or) patient, there are commonly two types of blood pressure sensors used they are manual or automatic sphygmomanometer better it is known as the blood pressure pressure cut off.

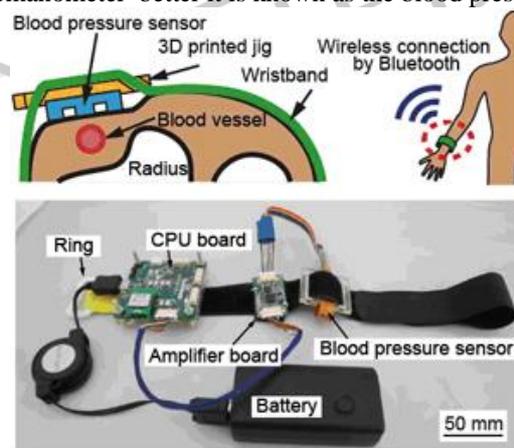


Fig:6 Pressure sensor in the patient wrist

IV. RESULT AND CONCLUSION

Where in this project the patient carries the all the three sensors the continuous monitoring of the patient is done where the threshold values are set in all the three sensors if the value from the sensors falls below the threshold value the alert system was also installed in the system this activates the alert system this is done in three ways

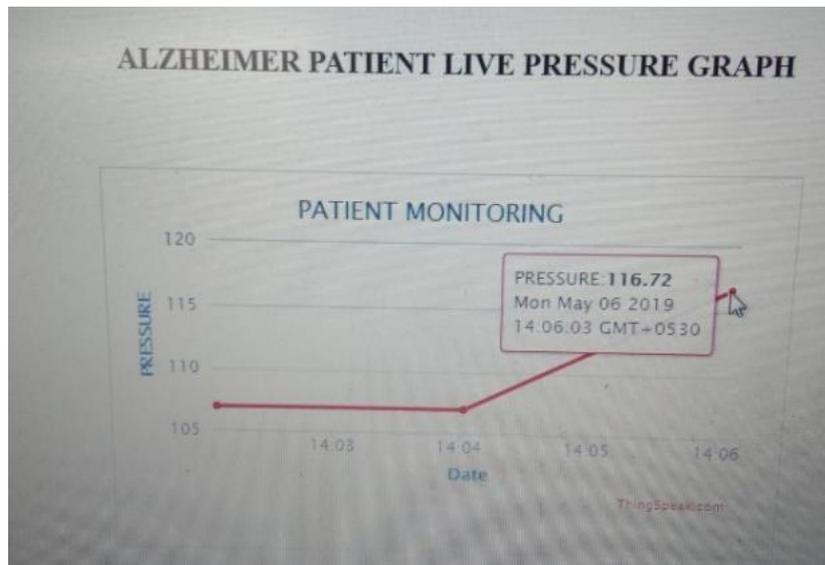


Fig:7 Pressure Graph of ALZHEMER patient

- 1.Through the speaker carried by the patient.
- 2.Through the message from the GSM module.
- 3.Through the continuous call to the doctor or the monitored person.

All the above three alerts are activated if the patient falls on the ground where the emergency buttons are also installed in the patient carrying module, in case any emergency needed by the patient he (or) she uses the emergency button for the help.

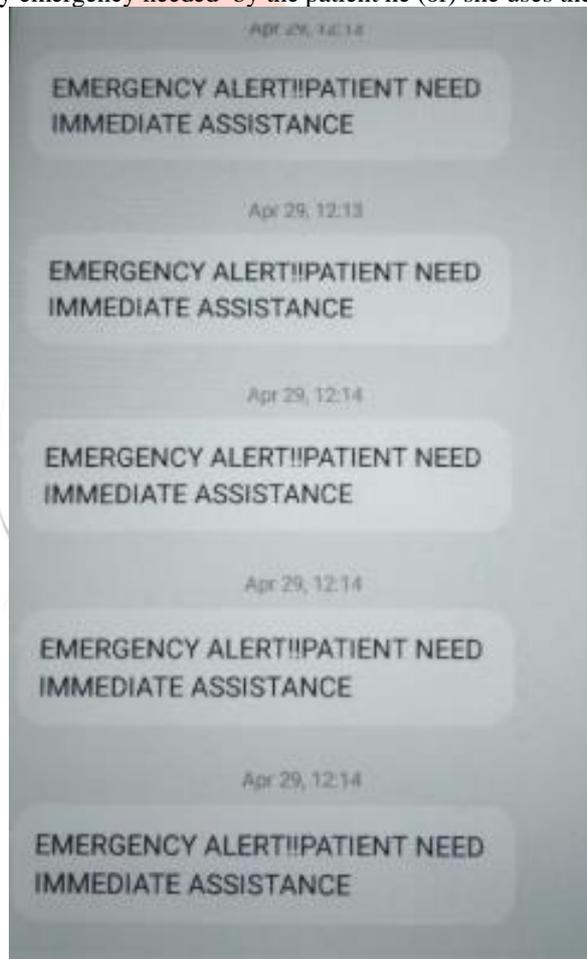


Fig:8 Emergency message received by doctor

Where for the displaying the graph in the internet the Think speak is basically an open source IOT and used to store the API and for the retrieving of the data using the HTTP protocol. where by using the HTTP protocol the different types of the graph can be obtained and displayed in the website.it is shown in the fig:9.

V.FUTURE SCOPE

The enhancement of the System Architecture and reduction in the size of the module and implementation of the more number of the sensors in the module and the efficient usage of the batteries and the replacing GSM with the wifi Module ESP8266 can help the project with the efficient monitoring of the patient and the efficient usage of the batteries can be achieved.

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