IOT BASED EPILEPSY MONITORING AND DETECTION USING AMBULATORY SYSTEM

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Abstract—In recent days numerous individuals have experienced the ill effects Of medical issues like heart related, cardiovascular, malignancy and various illnesses. Epilepsy is like a complex network disease, those who have seizures, which are controlled, and those who struggle on a daily basis. Many epilepsy patients cannot call for help during a seizure, because of the unconscious so it can lead to injuries, medical Complications and loses memory during the seizure attack. The seizures happen because of electrical activity in the brain, causing a sudden change in behavior at times seizures appear to be unique and on what part of the cerebrum they influence. This paper proposes a methodology for epilepsy individual which uses sensor to evaluate the parameters of the patients like temperature, fall of the patient, shaken of the hand and sound of the patient. The patient's status can be seen on PC through IOT so that the specialist/attendants can occasionally screen the patient's epilepsy.
Keywords—Epilepsy; Accelerometer sensor; Temperature sensor; undetector sensor; internet of things;

I. INTRODUCTION

Epilepsy is the fourth most normal neurological issue and influences individuals of any age and is "seizure issue." Many individuals with epilepsy have in excess of one kind of seizure and may have different indications of neurological issues too. A neurological issue set a part by sudden, repetitive scenes, loss of memory and irregular electrical action in the mind. Epilepsy is normally treated by pharmaceutical and now again by medical procedure. Many individuals are influenced by this neurological issue called epilepsy. At times it can have uncontrolled seizures and it can affect to body parts, for example, hands, legs and head. The main idea of Green task based sensing is that the communication happens over the network only when new data is present. Here we have utilized two accelerometers for identifying seizures. In this the microcontroller will measure different parameters, for example fall identification, shaking of hands, body.

II METHODOLOGY

In this system using an RF modem, it is possible to collect and analyze new data faster and more accurately. The sensor is advice which detects measures and records the signal or the data and send to the processor. The components include temperature sensors, accelerometer sensors, sound detector sensor, microcontroller, RF modem. Different parameters of patient like temperature, fall detection, shaking of hand and sound are measured by using wireless communication. The sensors are attached to the patient's body and the data measured will be transmitted to the laptop we canals record the patients' data so that the doctor can see the patients real-time monitoring information and physiological condition of patients.

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Sensors are used to sense the patient's physiological parameters. Various sensors are connected to the microcontroller which controls the signals   from the temperature sensor, accelerometer sensor, sound sensor and update the physiological parameters of the patient Thing speak.
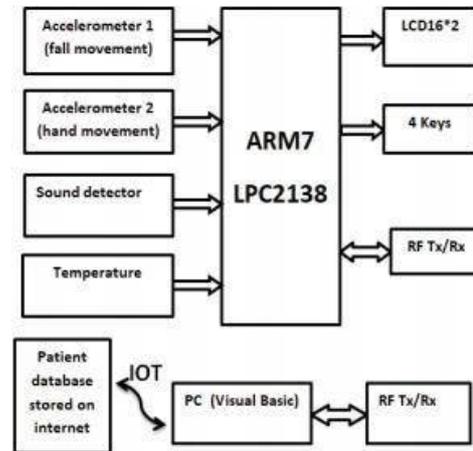
Epilepsy monitoring system architecture shown in Figure1

A. Temperature Sensor

The temperature sensor is utilized for body temperature of a patient. We can quantify temperature more precisely than a nutilizing a thermistor. The LM35 produces a higher yield voltage than thermocouples and may not require that the yield voltage be increased. The LM35 circuit temperature sensors, whose yield voltage is straightly corresponding to the Celsius temperature. The LM35 works at -55° to +120°C.

B. Accelerometer Sensor

The accelerometer sensor utilized as a part of the exhibited framework is ADXL335. In this system two accelerometers are utilized accelerometer1 is utilized to identify the fall of the patients and accelerometer2 is utilized for shaking of hand of the patients. Accelerometers are in one, two, or three orthogonal. It implies that ADXL335 reaction to both tilt and increasing speed as physical information.

C. Sound Detector

This is a multipurpose sound sensor which can be utilized to detect the sound of the patient. The sensor gives a computerized output when the deliberate sound increments past a set threshold. This edge level can be balanced utilizing a locally available potentiometer. The sensor yields a ration alone (+5V) at the advanced yield when it distinguishes sound and a rational zero(0V), when there is no stable recognized. A locally available LED is utilized to show the yield status.

D. RF Modem

RF Modem is a hand set module which gives simple to utilize RF correspondence at 2.4GHz. It can be utilized to transmit and get information on numerous baudrates from any standard CMOS/TTL source. This module is an immediate line in substitution for your serial correspondence it requires no additional equipment and no additional coding to transform your wired correspondence into remote one. It works in Half Duplex mode, that is it gives correspondence in the two bearings, however, just a single heading at the same time (not all the while). This changing from recipient to transmit mode is done consequently.

E. Seizures

In this paper four different types of seizures have been shown as follows:-

1. Atonic seizure: This sort of seizure causes loss of muscle control. In this we have demonstrated the temperature and fall of the patient.
2. Myoclonic seizure: This sort of seizure causes sudden jerks in any part of the body. These developments regularly occur in the arms and legs and also seen mostly in children. In this we have demonstrated the shaking of hand.
3. Tonic-clonic seizure: This sort of seizure causes loss of control of the body, shaking. A few people will lose control. In this we have demonstrated the fall of the patient.
4. Simple Focal seizure: This sort of seizure causes sudden jerks in any part of the body and during the seizure the patients shout. These developments regularly occur in the arms and legs. In this we have demonstrated the shaking of hand and noise.

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III. RESULTS

It gives the details about the patient like temperature, fall of the patient, hand movement and sound detection. The results how day wise report and can be recorded on things speak.

Fig.2.Hardware setup for epilepsy monitoring

Fig.3.Data sendon Things Speak

IV. CONCLUSION

This model of frame works fabricated utilizing distinctive sensors to be utilized for epilepsy sufferers, however, require additionally testing in genuine situations. More sensors can be actualized by including different sensors, for example, heart beat sensors, pressure sensors, and soon so to screen the epilepsy of the patient a suitable treatment should be possible precisely. The location of the subject can be tracked by using GPS (Global Positioning System). This system is implemented by using ARM7LPC2138, RF modem, accelerometer sensor, sound detection sens or, temperature sensor. The parameters are display dona PC using Visual Basics and send to Things peak.

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