

Smart Paroxysm Prediction and Life Saver System

¹Nalavadi Srikantha, ²Divyashree.P, ³Divya.N, ⁴Chaitra G.S. ⁵Gagana D.N
¹Project guide Dept. of ECE, ^{2,3,4,5}UG students Dept. of ECE
 Rao bahadur Y. Mahabaleswarappa Engineering college Ballari

Abstract : In this paper, the proposed system uses a wearable electronic device prototype where we can predict the development of epilepsy in advance. To detect epilepsy in the human body, the signal is utilized from the device, as soon it detects the coded signal is transmitted and it is decoded by a wireless receiver to produce signals for switching on alarm device.

Keywords - Smart Epilepsy Prediction, Wireless Receiver, Seizures, LED display, Microcontroller.

I. INTRODUCTION

In this paper designing of the system using RF communication for the epilepsy patients is been proposed. The wireless electronic diagnosing system used here is exclusive for epilepsy patients. The system helps in predicting the occurrence of seizures accurately. Epilepsy is a fatal condition which is caused due to the imbalance in nervous system. The symptoms of epilepsy includes sudden fluctuations in heart beat rate and involuntary muscular movements. During sleeping hours, if sudden seizures occurs patient may lead to death, if no immediate attention is provided by a doctor. With the aid of this system, the patients can lead a normal life. The system is a wearable device which predicts the occurrence of epilepsy few minutes before it occurs by utilizing signals from the human body and transmits the coded signal soon after it occurs. The signal is decoded by the wireless receiver to produce control signals through an alarm device and the message gets displayed on the led.

II. METHODOLOGY

1..Microcontroller based health care monitoring system using sensor network. Non invasive and continuous measurement of blood pressure becomes popular now a day[3]. This is very effective way for hypertensive patients to prevent cardiovascular problems and precisely regulate anti-hypertension cures. In this paper, we propose the microcontroller based continuous non invasive cuff less blood pressure measurement system with an alarm circuit for health care monitoring system. In sensor network system the light signal does not have any harmful effect on human body. Using sensor network in embedded system Pulse rate calculation and body temperature is determined. Accuracy of the system is found in acceptance range by comparing the results with the existing conventional systems. The microcontroller ATMEGA8L is used to control the system. This system is reliable, portable, accurate and cost effective[2].

2. Rf Based Wireless Notice board: Devices commonly used to display various notices are the notice boards. This is designed to display scrolling messages for notice board. For example, if implemented in colleges all information for students can be displayed. It is very convenient for students and college management to display any type of information and recent instruction[5]. This system can also be implemented for the people who are physically challenged.

3. The system presented here is a wearable device that can sense the in few minutes and takes necessary safety measurements automatically[2]. Hence a technician's assistance is not required for the patient. Therefore this device will be extremely useful for patients who wish to be active in their life. The user gets freedom from wires and can be used while moving. Sensing biometric signals: Muscular movements can be measured using mems sensor[1]. Processing it and taking decisions: Processing of the signals is done by software programmed into a microcontroller. The exact symptoms of epilepsy is detected by the software.

4. MEMS abbreviated for Micro-Electro-Mechanical Systems is a technology is shaped using micro fabrication techniques. The sizes of MEMS devices may differ from 1 micron to several millimetres. In like manner, the kinds of MEMS gadgets can differ from moderately straightforward structures having no moving components, to greatly complex electromechanical frameworks with various moving components under the control of incorporated microelectronics. The one primary model of MEMS is that there are in any event a few components having a type of mechanical usefulness regardless of whether these components can move. The term used to characterize MEMS shifts in various parts of the world. In USA they are vigorously called MEMS, but they are also known or called as "Microsystems Technology" or "micromachined gadgets" in various other parts of the world. Most of the MEMS functional elements include sensors, microelectronics such as microactuators, microsensors, etc., and transducers which are used for converting energy from one form to another. On account of microsensors, the gadget ordinarily changes over a deliberate mechanical flag into an electrical flag.

5. A standard serial interface for PC, RS232C, requires negative logic, i.e., logic 1 is -3V to -12V and logic 0 is +3V to +12V. The converter chip of microcontroller uses transmitter and receiver pins to convert TTL logic. A MAX232 chip has long been using in many microcontrollers boards. It is a dual RS232 receiver / transmitter that meets all RS232 specifications while using only +5V power supply. It has two onboard charge pump voltage converters which generate +10V to -10V power supplies from a single 5V supply. It has four level translators the first two levels transmitters converts TTL\CMOS into 9V outputs. The other two level translators are RS232 receivers that convert RS232 input to 5V[1].

6.APR9600 is a low-cost high performance sound record/replay IC incorporating flash analogue storage technique. Recorded sound is retained even after power supply is removed from the module. The replayed sound exhibits high quality with a low noise level. Sampling rate for a 60 second recording period is 4.2 kHz that gives a sound record/replay bandwidth of 20Hz to 2.1 kHz.



Fig1:Voice IC ARP9600

III.WORKING PRINCIPLE

This paper describes working principle of two sections, transmitter and receiver sections as shown in the fig2 and fig3 respectively.

BLOCK DIAGRAM:

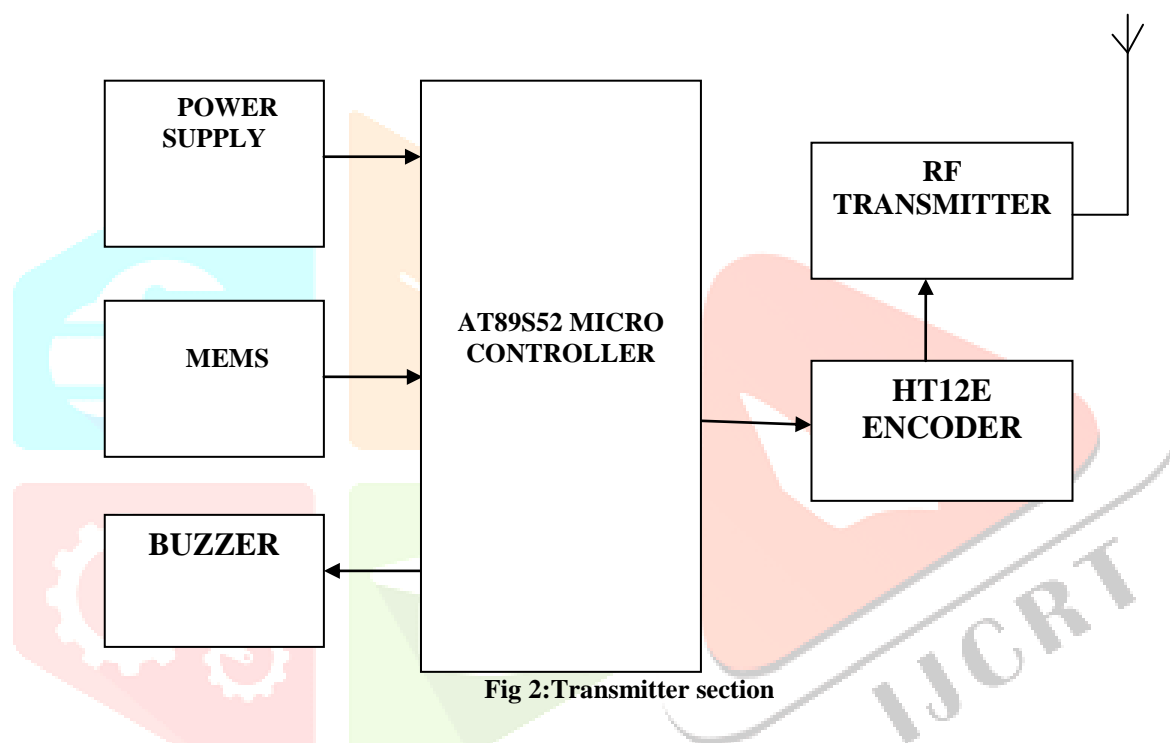


Fig 2:Transmitter section

Transmitter section consists of MEMS which are attached to the patient. It detects any change in the body movements of patient. When there occurs any change in the body movements of patient buzzer will buzz which alert about the situation. This information is transmitted to the receiver section using RF transmitter and it is received by the RF receiver and given to microcontroller.

From controller the information is given to voice IC which gives the voice announcement about the change in body movements of patient. Thus this project is useful to react immediately to the movements of the paralysis patient and can help them for their needs.

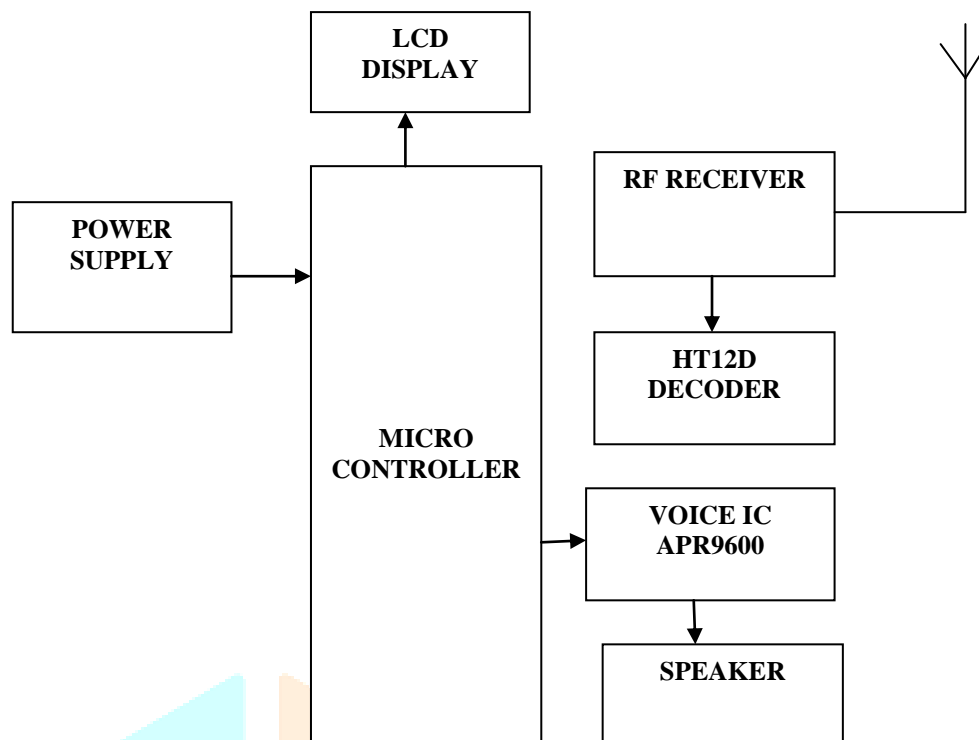


Fig 3:Receiver section

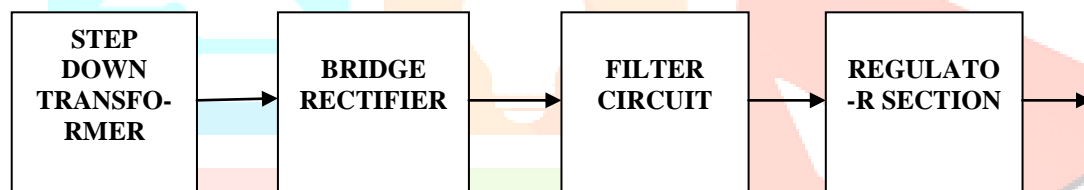


Fig 4:Power supply

ADVANTAGES:

- The benefit is that a lightweight, rugged, low-cost, wearable (on the wrist) device is developed which helps a victim of epilepsy to do all sorts of activities like others do.
- The device will be extremely cost effective since it uses simple sensors and technology for the detection.
- The sensors are small in size and can be firmly attached to the body can last long as the device consumes only little energy
- The device doesn't restrict the movement of the patient.
- The system is easily expandable paving the way to incorporate much more sophisticated devices like ECG detector in the future

IV. RESULTS

The proposed system can be implemented to predict the movements of patient and can help them.

PROBLEMS ENCOUNTERED:

We have encountered many problems as noted below:

Non availability of 3 axis accelerometer: We could not procure the 3 axis accelerometer and hence testing is only performed with a single axis accelerometer. However, the system gives better results only if a 3 axis accelerometer is used in for detecting muscle contractions. Noise and temperature effect on the sensor outputs: Major problems were encountered due to noise picked up by the sensors. Use of shielded cable and grounding solved the problems to a satisfactory level. Heating effect of active components like op amps also created problems like drifting and thermal noise.

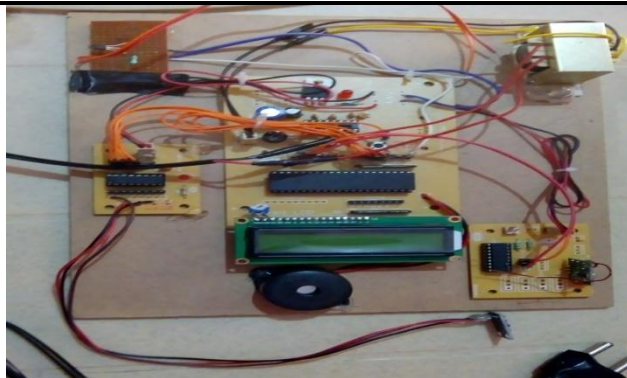


Fig 5:Transmitter

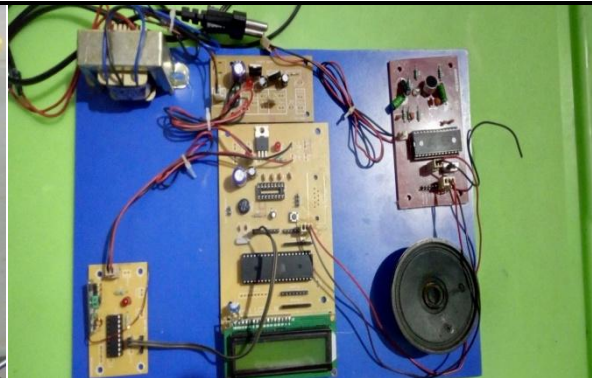


fig 6:Receiver

I. CONCLUSION:

A cost effective light weight wearable device which is developed helps millions of victims to epilepsy around the globe. With the device an epilepsy patient can move freely like normal people without any kind of worries. The microcontroller device can be easily expandable to the GPS command where we can capture and transmit various parameters like body temperature etc. We can extend this project with the help of including the GSM system where we can transmit the messages to the recipient person with the exact location of the patient and take the necessary actions.

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