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AUTOMATIC FALL DETECTION IDENTIFICATION AND MONITORING SYSTEM FOR ELDER PEOPLE

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Abstract: Paralytic people in most cases are able to speak properly nor do they convey through sign language due to loss in motor control by their brain. In such a situation, our proposed system helps the disabled person in displaying a message over the LCD by simple motion of their hand. The proposed system works by reading the various tilt directions of the hand. The transmitter is attached to a glove which is worn by patient. User just needs to tilt the device in different directions to convey different messages. An servo motor is used to measure the statistics of motion. It then passes on this data to the microcontroller which processes the data and displays the particular message as per the input obtained

Keywords: Patient Monitoring, IOT, Paralysis Patient (keywords).

1.Introduction

Paralysis can occur due to the loss of muscle function in a human body. There are two types of Paralysis, temporary and in some cases, it is permanent. Paralysis is not restricted to any specific portion in the human body, but in most of the cases the paralysis may be observed in limbs. Paralysis can occur as partial or complete. Stroke is a common factor which triggers either a partial or complete paralysis in the patient. Under partial paralysis condition, the patient observes a partial control of the affected muscle. In complete paralysis condition, there is no control over the affected muscle tissue [1]. Paralysis observes some common symptoms like spam, loss of sensation in arms and legs, decrease in the muscle functions, decrease in motor functions and losing the ability to talk. Some forms of paralysis may allow the patient to lead a normal life, while some may cause severe complications [2]. Dependence on crutches, wheelchairs, full-time nursing may surge significantly [3,4].Paralysis is the inability to move muscles on their own and with determination [5]. These persons are not capable of full body movement as compared to a normal person. These paralytic patients cannot be accompanied by others all then time and they are left alone. They end up in situations where they need emergency support and care. People suffering from some forms of paralysis are able to move their hands and legs [6]. This movements of limbs accompanied by IoT technology can pave a way for the people suffering from paralysis [7,8]. With this as motivation, a cost-efficient system is proposed to help the paralytic patients.

2. Existing Methodology

In existing system of methodology, only there exists the technology of monitoring the patient heart rate in the nearby terminal display unit and the remote monitoring is enabled only when there exists the WIFI connectivity.
1.In this monitoring system, the implementation of the module is for the paralyzed patients.
2. This module comprises of parameters include heart rate, respiration rate, temperature.
3. The primary function of this system is to monitor the heart rate, breathing rate, temperature of the paralyzed and the data collected by the sensors are sent to the

cloud from there we can get alerts.

3. Proposed Methodology

The proposed model will be very useful for people who are suffering from partial paralysis conditions like hemiplegic condition in which one arm and leg on same side of the body is paralysed, monoplegic condition in which one arm or leg is paralysed, paraplegic condition in which both legs are paralysed, whereas this model cannot be useful for people suffering from tetraplegic condition in which both legs and arms are paralysed [9,10]. The proposed system will be an effective aid for paralytic patient to convey and communicate with their dear ones without any difficulties [11,12]. The proposed system is envisioned to satisfy many objectives, whereas the primary objectives of the proposed monitoring system are as follows:

• To help the patient to convey messages to doctors, nurse, or his/her family members over the internet.
• To recognise sign language.
• To detect the hand movements measured at a distance.

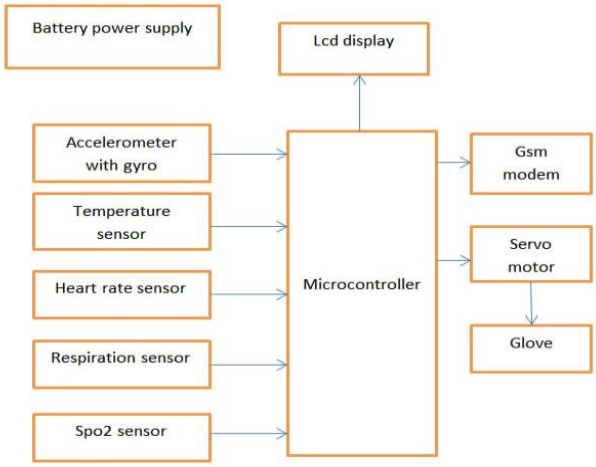

Figure 1: Block diagram of proposed ideology

4. Schematic structure:

A .Arduino Uno

Arduino uno is a smaller version of Arduino Uno ,with an operating voltage of +5V. The Arduino Uno can be powered via the Mini-BUSB connection,6-20V unregulated External power supply ,or 5V regulated external power supply. In our model, Arduino Uno plays a vital role due to its light weight as paralysis patients already find it difficult to move their hands [13-15]. Also , Arduino Uno has power consumption of 19mA which reduces the load produced by this.

In the transmitter side ,Arduino Uno collects the value s measured by the 3-axis accelerometer and forwards it to the encoder ,which then encodes the data and transmits the data with the help of the antenna which is connected to the transmitter module. In the receiver side, Arduino Uno receives the decoded information from the decoder and it displays the message sent by the transmitter via the LCD display.

The buzzer is also connected to the Arduino Uno which produces a sound when a message is displayed on the LCD display. Also, Arduino Uno is connected to ESP8266 Wi-Fi module which is connected to the IoT cloud and the message conveyed by the patient is displayed in the IoT cloud.

A.Accelerometer

It is a digital accelerometer sensor and it output digital values of linear Acceleration in three axes. The sensor outputs data is for mattedas16- bit two's complement that is accessible via SPI or I2C interfaces.ADXL345 measures static acceleration due to gravity as well as dynamic acceleration resulting from motion or shock. The accelerometer measures the linear acceleration produced and it converts the linear acceleration into the data needed for the Arduino Uno into x , y and z coordinates. The data from the accelerometer is sent to Arduino Uno via serial communication.

The GND, SDA and SCL pins of the accelerometer are connected to GND, SDA and SCL pins of the Arduino Uno. VCC pin of the accelerometer is connected to 3.3Vpin of the Arduino Uno.

B.ESP8266WiFiModule

This ESP8266 Wi-Fi module is used for the purpose of sending the data obtained by the process of decoding the message sent by the transmitter to the IoT cloud [16-18] This Wi-Fi module is programmed via the micro USB port using the Arduino IDE platform .The ESP8266Integrates 802.11b/g/n HT40 Wi-Fi transceiver, so it cannot only connect to a Wi-Fi network and interact with the Internet, but it can also set up a network of its own, allowing other devices to connect directly to it. The VCC pin of the Wi-Fi module is connected to 3.3V of Arduino Uno. TX pin of wi-fi module is connected to D2 pin of Arduino Uno. RX pin of Wi-Fi module is connected toD3 pin of Arduino Uno.

C .RF Transmitter and Receiver

RF transmitter is used for the purpose of transmitting messages produced by the relative motion introduced by

tilting the glove. VCC pin of transmitter is connected to +3.3VofArduinoUno.

RF receiver is used for receiving messages which are produced by the relative motion produced by tilting the glove at the transmitter side. Pin 4and5(VCC) of the receivers areconnectedto+3.3Vpin of Arduino Uno. RF transmitter and receiver which are operated at the frequency of 433.3MHz can provide a range of about 100meters for transmission and reception of the messages.

D.Gyro Sensor

Gyro Sensor used for the purpose of motion sensing device. They are capable of sensing movements that are difficult for humans to detect, such as rotation and changes in orientation. The crystal elements in Epson's gyro sensors are made of high-quality quartz crystal grown by Epson and have a double-T structure. They are low noise and offer exceptional sensitivity, temperature characteristics, vibration resistance, and impact resistance. This makes it possible to detect quantities such as the direction of rotation, rotation angle, and vibration.

E. Servo Motor

A servo motor is used which can rotate with great precision. Normally this type of motor consists of a control circuit that provides feedback on the current position of the motor shaft, If want to rotate an object at some specific angles or distance, then it use a servo motor. It is just made up of a simple motor which runs through a servo mechanism. If motor is powered by a DC power supply then it is called DC servo motor, and if it is AC powered motor then it is called AC servo motor. If want to rotate an object at some specific angles or distance, then you use a servo motor. It is just made up of a simple motor which runs through a servo mechanism. If motor is powered by a DC power supply then it is called DC servo motor, and if it is AC-powered motor then it is called AC servo motor. A servo motor usually comes with a gear arrangement that allows us to get a very high torque servo motor in small and lightweight packages. Due to these features, they are being used in many applications like toy car, RC helicopters and planes, Robotics, etc. A servo consists of a Motor (DC or AC), a potentiometer, gear assembly, and a controlling circuit.

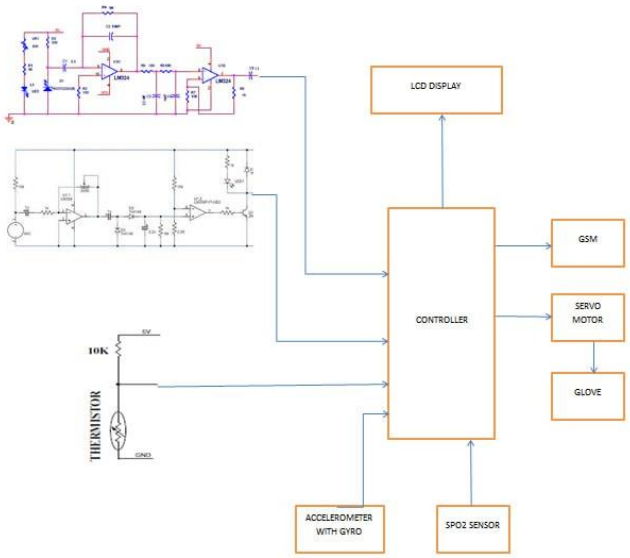

Figure 2: Circuit diagram

A Arduino ID Arduino Integrated Development Environment (IDE) is a cross - platform application that is written in functions from C and C++. It is used to write and upload programst Arduino compatible boards. The Arduino IDE is used for the purpose of uploading the code required for the working of the transmitter, receiver and the Wi-Fi module.

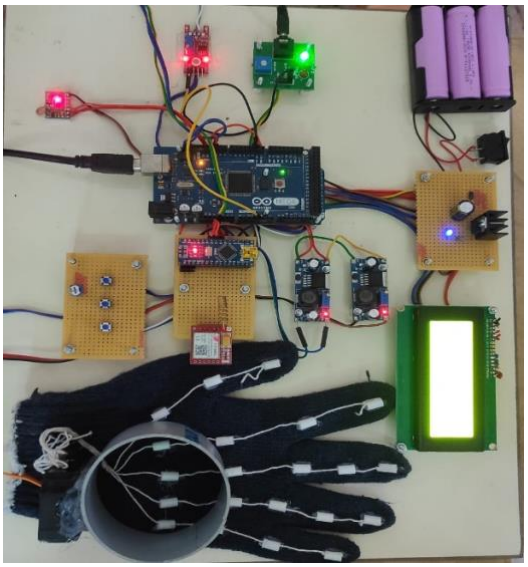

Figure 3:Output Image

In this result developed paralysis patient monitoring system monitor the patient using accelero meter guiro, servo motor if any abnormal detected in patient the alert message will send to the relatives. The abnormal data

heart rate, respiration rate, will intimate to the relatives.

5. CONCLUSION

IoT enabled Paralysis patient healthcare helps to know the health status and needs of the patients by being at a remote place.This system model plays a vital role by being an assistive aid for people who are affected by paralysis. The IoT cloud stores the messages gives an overview of the health status of the patient over a period of time.

Further development can be made by using additionally gyro sensor and flex sensors which brings in more applications to be included to our proposed system. Gyro sensor can be used for the purpose of measuring the rotational movement of the hand and flex sensor can be used to detect them made by individual fingers .GSM module can be used additionally for the purpose of sending the messages conveyed by the paralyzed patients by sending a SMS to the registered person

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