



AUTOMATED PARALYSIS PATIENT HEALTHCARE SYSTEM

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Abstract: We come across hospitals and NGOs serving paralytic patients who have their whole or partial body disabled by the Paralysis attack. These people in most cases are not able to convey their needs as they are neither able to speak properly nor do they convey through sign language due to loss in motor control by their brain. In such a situation we propose a system that helps disabled person in displaying a message over the LCD by just simple motion of any part of his body which has motion abilities. This system also takes care of the situation where in no one is present to attend the patient and thus sending a message through GSM of what he wants to convey in SMS. There are several instruction of movement gesture sensors presented in the paper in order to assist health officer in helping the paralyzed patient to complete their needs. The user now just needs to tilt the device in a particular angle to convey the message. Thus, by tilting device one can convey message easily. So, this system can help them out to convey a message.

Index Terms -

I. INTRODUCTION

Paralysis is the inability to move muscles on your own and with purpose. It can be temporary or permanent. The most common causes are stroke, spinal cord injury, and multiple sclerosis. Paralysis can be a complete loss of movement known as plegia, or a significant weakness called paresis. Paralysis is most often caused by damage in the nervous system, especially the spinal cord. Other major causes are stroke, trauma with nerve injury, poliomyelitis, cerebral palsy, peripheral neuropathy, Parkinson's disease, ALS, botulism, spina bifida, multiple sclerosis, and Guillain—Barre syndrome. For example, monoplegia/ mono paresis is complete loss of movement or weakness of one limb.

Hemiplegia/hemiparesis is complete loss of movement or weakness of arm and leg on same side of the body.

Paraplegia/paraparesis is complete loss or weakening of both legs. Tetraplegia /tetra paresis or quadriplegia/quadruparesis is complete loss or weakness of both arms and both legs.

Paralysis is caused by injury or disease affecting the central nervous system (brain and spinal cord) which means that the nerve signals sent to the muscles is interrupted. Paralysis can also cause a number of associated secondary conditions, such as urinary incontinence and bowel incontinence.

Though, there are innovative approaches for curing or treating paralysis patients, but the aim of treatment is to help a person adapt to life with paralysis by making them as independent as possible. Where we see a problem with these types of devices that are being developed is that they are very large and expensive machines. They seem to be only available in hospitals and not able to be used at the patient's home or at their convenience. Our goal is to make a device

that will be able to restrain a patient's motion but have them be able to use the device themselves and have it be cheap enough for them to afford without much debt.

II. EXISTING SYSTEM

The project used the technology in telecommunication, where the evolution in telecommunication was applied in this project by using GSM module SIM900A. At the same time, a few circuit and software are used to be a controller for all the main and sub equipment. A few components like microcontroller and GSM module are used. By using the gesture sensor, it will aid the patient to convey anything that they want through the GSM module by sending message. The function of this sensor is that the patient just needs to move the body part to which the sensor is attached to convey a message. Besides this, the data will be displayed at the LED screen to know what the patient want to convey. On the other hand, the buzzer will sound when there is any emergency case and the SMS alert will be sent to the care taker of the patient. The main aim of this project is to help paralyzed patient to convey their message or need.

III. PROPOSED SYSTEM

The proposed system helps in communication for the paralyzed patients using simple hand gestures. The accelerometers are mounted on the gloves such that each accelerometer pertains to each finger. This accelerometer is connected with the help of connecting wires to the Arduino UNO which is Atmega8. The initial or stable value of the accelerometer changes when the direction of the accelerometer is changed. According to this value, the messages that are pre-coded such as "call the doctor" or "emergency" are displayed. The beep sound propels the system in order to alarm when the message is displayed to alert the attendants of the patients.

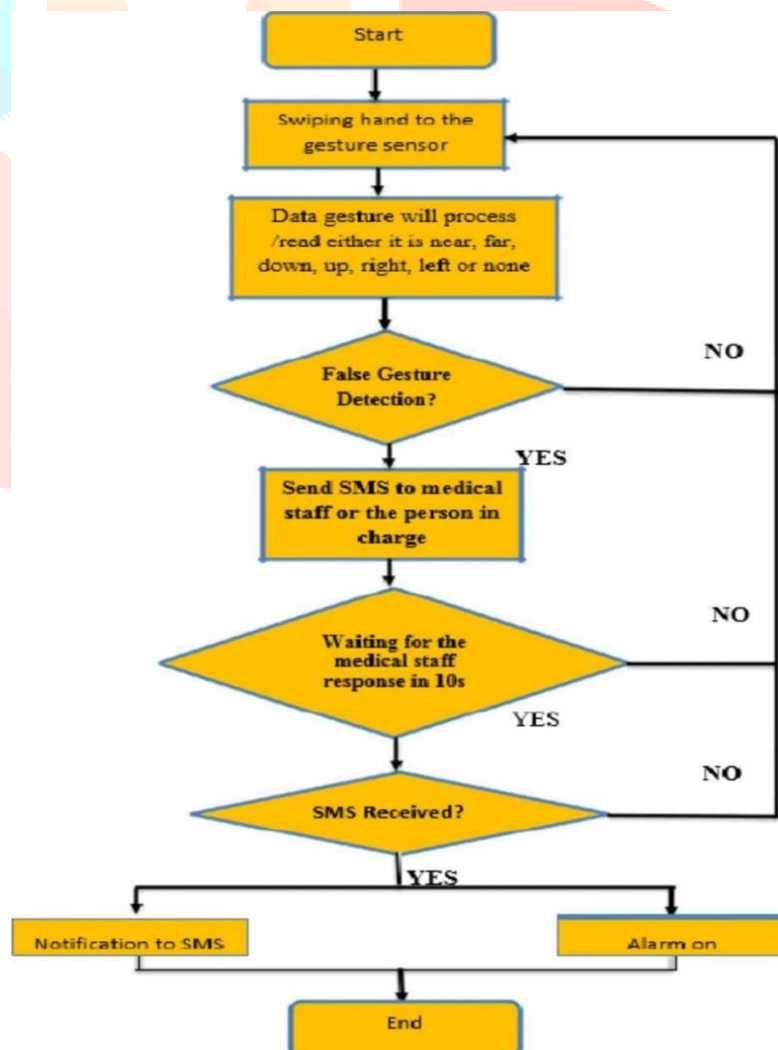


Figure 3.1. Proposed System

3.1.SYSTEM CONFIGURATION PROCESS

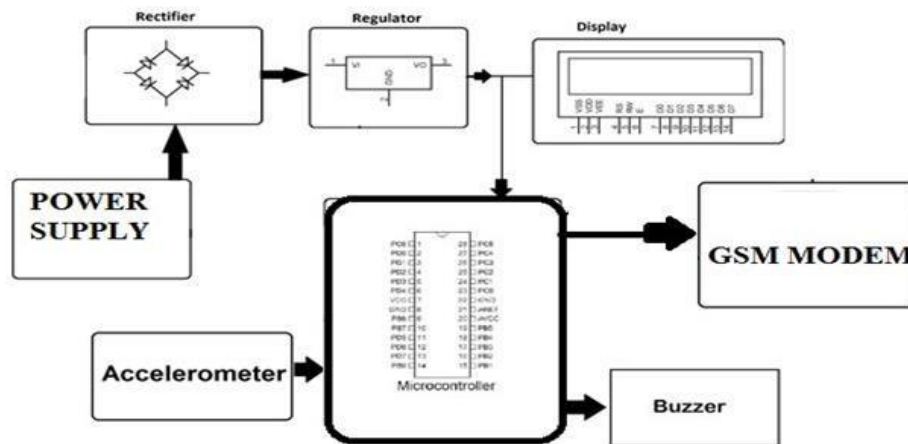


Figure 3.2. Block Diagram of the System

The first unit in this project is accelerometer that is capable of detecting the gestures due to change in position. On the change of position, the sensor gives the Analog variation of the voltage on its x, y and z pins. We convert this Analog variation into digital format using Op-Amp As comparator in which we set a threshold voltage (comparison) using preset and the according to the input voltage the voltage is either high or low. LM324 is quad op-amp IC used here. This circuit generates various 4-bit binary sequences on the change of its position. This sequence is transmitted over RF channel. The transmitter section will be attached to accelerometer circuit which will give parallel binary data as input to the HT12E encoder that encodes the parallel data to serial data. Now this serial data is transmitted over 434Mhz carrier channel using ASK modulation through a short dipole antenna.

IV. LITERATURE SURVEY

The opportunity for patients to have constant monitoring of their health state is now possible by means of intelligent sensors. The continuous monitoring of health status is a fundamental practice for paralytic patients. In a hospital either the nurse or the doctor has to move physically from one patient to other for continuous health monitoring, due to which it is not possible to monitor one patient continuously. Thus, any critical condition cannot be identified unless the doctor or nurse check the patient's health at that time. So, a system is developed to convey a message from patient to person monitoring his health.

Year	Author	Title	Objective	Methodology
July 2018	D Shiva Rama Krishnan, Subhash Chand	IOT based patient health monitoring system.	Nowadays Health-care Environment has developed science and knowledge based	This system basically uses a sensor technology and internet to communicate message to their loved ones. It uses temperature and heartbeat
	Gupta, Tanupriya Choudhury		on Wireless-Sensing node Technology oriented. This is designed for monitoring patient's health and alerting their loved ones on the same.	sensor to measure the rates and monitor the patient's health.
July 2017	Jaiee Sitaram Adivarkar	Patient monitoring system using GSM technology.	It is used to monitor the patient's heart rate and temperature.	Heart rate is measured from the index finger using IRD (Infrared Device) sensor. The device alarms when heart rate and body temperature exceed the threshold value. The sensor measures the information and transmits through GSM modem.
Jan 2016	Bandana Mallick	Heartrate monitoring system using fingertip through Arduino and processing software.	A measurement of heart rate through a tip and Arduino.	It is supported by the principle of photoplethysmography (PPG) that is non- invasive methodology of measure the variation in blood volume in tissue employing a source of illumination and detector. The signal may be amplified and is shipped to Arduino with the assist of process computer code pulse watching and investigating is performed.
March 2017	Kumara K R	Sensor based Wearable system to assist paralytic patient with continuous health monitoring.	In extreme case of paralysis, the patient may be speech impaired which makes it difficult to convey the message. So, this provides solutions to these inabilities.	The patient is made to wear the sensor gloves. When the patient bends his/her fingers to express the requirements it will be interpreted into auditory speech through which the patient's caretaker can understand the needs of patient.

FIGURE 4.1 LITERATURE SURVEY

V. RESULTS

The main aim of the project was the development of automated paralysis patient healthcare system using GSM. And we have already tested the time taken for receiving SMS from GSM module to the hardware component, i.e., mobile or device to which output is connected. Based on that the analysis of the performance of the system is done. Paralysis patient's need to be taken care almost for 24 hours and they need someone beside them all the time to be taken care of. So based on the gesture they can convey the

message to the care taker and the output is the digital format. Based on the gestures the output is digitalized.

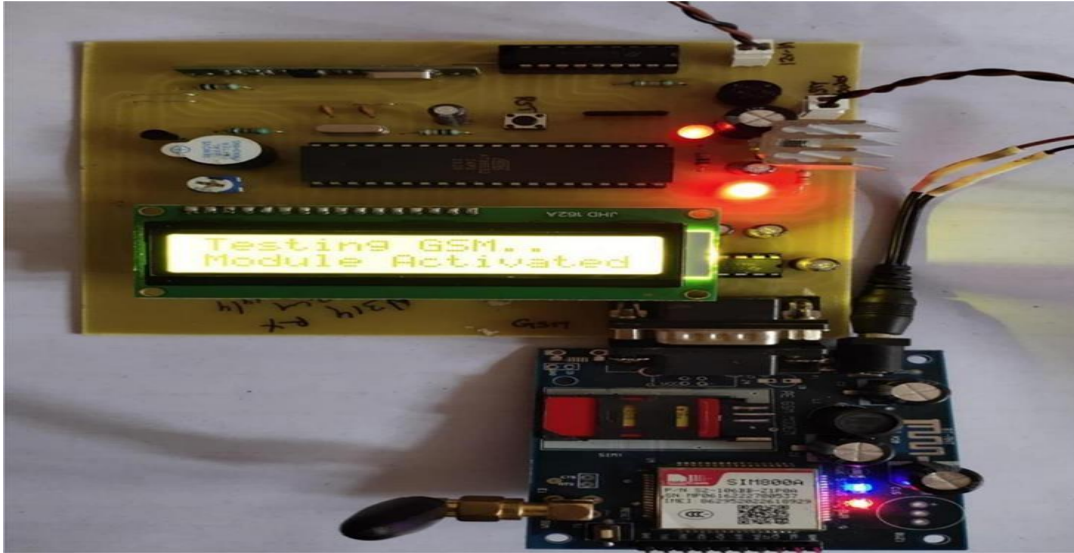


Figure 5.1. Activation of Device

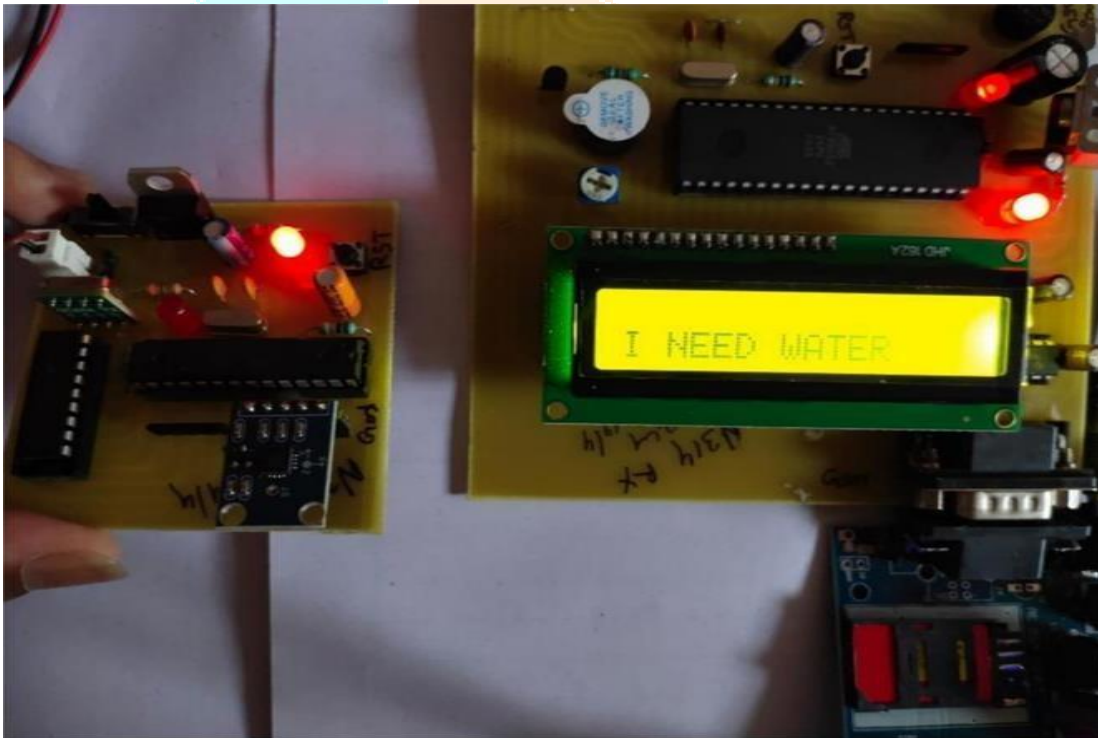


Figure 5.2. Output of The Circuit

VI. CONCLUSION

Though there already exists a several systems to monitor the paralyzed patient's health, there are not many systems that focuses on communication of them. But this system bridges the gap between the patient and others via communication and helps the paralyzed patient to relieve their stress by revealing their thoughts and help them to motivate as much as possible. And this system is cheap enough to afford without much debt and is useful also.

VII. FUTURE SCOPE

The future scope of the project: In future, the system can be made smart and efficient by making the goggle wireless for eyeblink detection. It can be made by using Bluetooth and Wi-Fi technology. So as to make system efficient and secure as well as easy to handle. Also, for constant patient monitoring some indications for security can be added like light indicators.

Instead of using GSM module monitor patient's parameters on mobile in case of if patient is in hospital. So, it becomes useful in hospitals for continuous monitoring of body parameters on doctors mobile or main mobile of hospital ward.

According to the availability of sensors or development in biomedical trend more parameter can be sensed and monitored which will drastically improve the efficiency of the wireless monitoring system in biomedical field.

A graphical LCD can be used to display a graph of rate of change of health parameters over time. The whole patient's healthcare monitoring system which we have framed can be integrated into a small compact unit as small as a cell phone or a wrist or smart watch. This device is easy to handle the patients or other persons.

VIII. REFERENCES

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