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# AUTOMATED PARALYSIS PATIENT HEATHCARE SYSTEM

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*Abstract*— We come across hospitals and NGO's serving disabled people. Now these people are not capable of full body movement as compared to a normal person. In such a situation we propose a system that helps disabled person display a message by just simple motion of any part of his body. Our proposed system works by reading the tilt direction of the user part. This device needs to be mounted on user finger of hand. The user now just needs to tilt the device in a particular angle to convey a message. Tilting the device in different directions conveys a different message.

## I.Introduction

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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–Barrésyndrome. For example, monoplegia/monoparesis 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/tetraparesis or quadraplegia/quadraparesis 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.

Eventhough, 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 patients home or at their convenience. Our goal is to make a device that will be able to retrain 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. Related Work

Nowadays, telemedicine represents a very important research avenue. Significant effort has been deployed in assisting the patients in their everyday life through telehealth and telemedicine systems. In 1. The author describes a wireless patient monitoring system that could allow patients to be mobile in their environment. The developed system includes a pulse oximeter to measure blood oxygen concentration and the patient's pulse, as well as a temperature sensor to keep track of the patient's temperature. The proof of concept was successful, and allowed for multiple patients at the same time on the same network the ability to add many more patients.(2) data transmission within the system and network related issues and (3) system integration in existing communication networks in the Internet-of-Things (IoT) pardigm.

An early system that uses a cell phone application for remote monitoring that uses a GPS, an accelerometer and a light sensor is described in [2]. The prototype in [3] allows physicians to remotely asses the patients health in and outdoors. Alongside sensors that acquire the data from the patient, their prototype also includes an alert system for emergency cases.

In [4] the authors propose a monitoring system based on Embedded Network Gateway Servers (ENGS). These devices can serve the acquired data via an embedded web server and have modular design in order to be interfaced to a variety of sensors. The authors of [5] detail the specific challenges posed by the design of wearable patient monitoring devices. They address in detail power consumption, data acquisition and filtering issues.

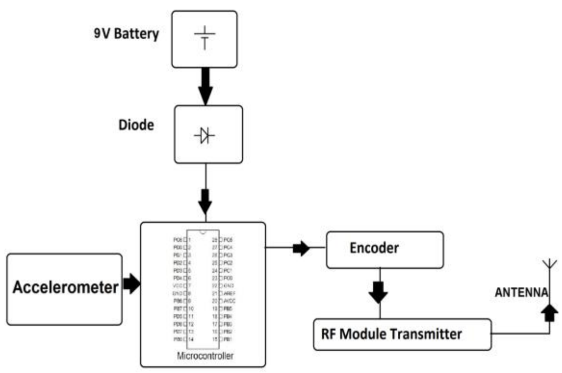
## III. System Design and Implementation

To overcome all the above drawbacks and meet the requirements of the system, we propose a system which mainly consists of a transmitter and a receiver section. In the transmitter section (at the patient side), a two axis accelerometer will be placed on the finger of the patient. This accelerometer is capable of measuring the static acceleration due to gravity and thus finding the angle at which the device is tilted with respect to the earth. Whenever patient needs any help he tilts the accelerometer in different directions. This acts as an input to the accelerometer while output of it is in volts that is connected to the controller board which acts as the processing unit. The output of the accelerometer depends on the tilt angles and is read by the controller. The controller maps the input voltages between 0 and 5 volts into integer values between 0 and 1023 as analog data from the range of 0-1023. This range provides a lot of sensitivity and a slight shift can lead to change in value. To reduce the complexity and provide a simple way for the patients, we reduced its sensitivity by mapping it to 0-5 volts and then provided a range for front, back, forward and backward. These directions can be easily understood and used by any person using his/her thumb or any part of the body capable of moving in these directions. A predefined message catering to the basic needs of the patients and those required for emergency will be stored in the ranges assigned to a particular direction as mentioned above. For example: food/water is the message displayed when the patient moves his finger to the right. So on tilting the accelerometer to the right, it will send its value to the controller. If this value lies between the range assigned to the right direction the predefined message that is food/water in this case will be sent to the next module that is the RF transmitter module. The RF transmitter becomes active when a message is sent from the controller for transmission. RF transmitter and receiver works on the frequency of 434 MHz. The accelerometer will be connected to each patient and each patient will have a controller board and transmitter for sending his messages.

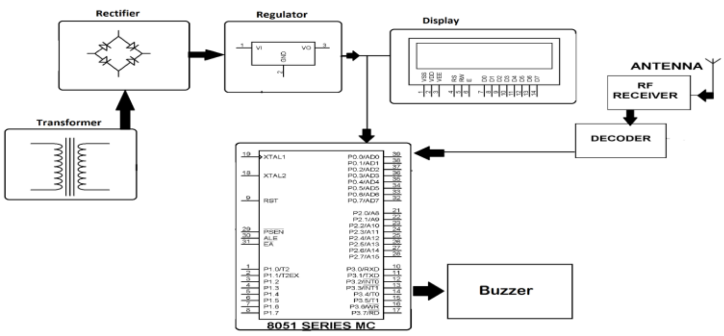
For identification of different patients their name or number is sent to the nurse. All these transmitters can be connected centrally to one RF receiver which works on the same frequency as the transmitter. Thus the proposed system will provide a many to one communication.[1] At the receiver side, RF receiver will receive the message and send it to the controller board on the receiver side which will then display the message on the LCD. On reception of the message, nurse will remotely take the required action to cater to the needs of the message. In case of emergency the patient has to just press a push button which will signal the processing board to send an emergency alarm to the receiver. The receiver will then signal the controller to activate the buzzer. This will help the nurse to take care of the emergency as soon as possible. Taking medication at the right time is a serious business, the Medicine Reminder is another feature of this device to prompt the nurse the time to give patients their medicines. The Medicine Reminder is intended to be used by the nurse or caretaker so that a mistake is never made in giving the medicines. The medicine reminder is implemented using a real time clock.[4] Usually for real time DS1307 Real time clock chip along with a battery is used, but this increases the reqirement of hardware used and makes the device bulky. So we propose a system in which the time table of all the patients will be stored in the database and the nurse will be reminded automatically when it's time to attend any patient according to the time table. This will be implemented by programming the controller board**.** On interfacing the LCD with the controller and feeding the code in the software, the real time clock runs the time on the display.

## IV. BLOCK DIAGRAM

**Transmitter**




**Receiver**



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