International Journal of Advance Research in Science and Engineering
Volume No.07, Special Issue No.07, April 2018
www.ijarse.com
IJARSE
ISSN: 2319-8354

Motion Based Message Conveyorfor Paralyzed/Disabled People

Tonesh Babu V A[1], Sudhakar K R[2], Sunil[3], Srinath K S [4], Nataraj Urs[5]

[1,2,3,4,5]*School of Electronics and Communication,, REVA University, Bangalore-560064(India)*

ABSTRACT

This project is employed to establish a reliable communication between disabled patients and normal people. A device known as accelerometer is the heart of the system. This device will be mounted on patient's body part which has movement. The direction in which the body part moves decides the message to be displayed on LCD and the buzzer sounds each time when a patient wants to communicate. The prototype for data transmission includes Arduino Uno and Zigbee technology. A patient can easily send a message to the required person or nurse (if the system is used in hospital) by just tilting his body part in the direction he/she wants to. Each direction will have a predefined message to meet the patient's basic needs. This project also has a Bluetooth module and the message displayed on LCD will be converted to speech form and the same will be heard on your mobile phone through Arduino voice controller app. This project is effective, simple yet efficient way to solve the problem of communication of disabled people.

Keywords : *Accelerometer, Arduino Uno, Bluetooth module, Zigbee*

I. INTRODUCTION

As we all know India is the second highest populated nation in the world has over 25 million disabled people which is the second highest in the world. Though there is some advancements done in the medical sector, very few actually focus on paralyzed/disabled people. There is no actual verbal communication between patients and normal people. These patients face a lot of problems in their daily activities. The main purpose is to replace the conventional way of patient-nurse interaction in hospitals with modern technology that is capable of creating reliable and faster communication. In the presentday scenario, patient has to depend on any of the family member or the ward boy for the daily basic needs. It is also a problem for the family member or the ward boy as he should constantly keep a check on patient's needs.Our objective is to make such patients independent to communicate only when necessary for his basic needs. It is done by just tilting a device in particular direction located on patient's body that is capable of movement. It also eases out the job of a nurse as she has to monitor many patients allotted. After the patient sends the message when required, the nurse can take immediate actions on the patient. The nurse will be alerted either through the buzzer sound or through the speech output on her phone. All these ideas grouped together creates an efficient way of communication between the nurse and patient and focus on building a smart system to make the patient self-sufficient.

II. RELATED WORK

In [1] , the authors designed an intelligent wheel chair which works on wireless hand gesture for disabled people. It also has a distress call system (GSM) to alert concerned people at the time of emergency. The wheelchair motion is controlled by microcontroller. This helps a disabled to move independently without any others help but there is no communication through words if the patient is dumb or paralyzed and that is a drawback.

In [2], the authors designed a system to control household devices like fan,T.V, radio, lamp etc. They used an actuator and a power control section for the disabled/paralyzed to control these devices. It also consists of a monitor to show the current devices that are used by patients. The monitor is connected to power control section.

In [3], this paper presents about an automatic wheel chair which is controlled by EOG signals and voice. EOG (electrooculography) is a technology to recognize the movements of an eye. This works on the principle of recording the polarization potential or corneal-retinal potential(CRP). Neural network in the body is responsible for achieving personalization.

In [4], a communication system is implemented which converts signal languages used by dumb people to speech. This is helpful for patients suffering from spinal cord or neuromuscular disorders. A narrative hand gesture recognition technique is used here. The gesture recognition is done with the help of a sensor called accelerometer which is placed on the sensor glove. The system is controlled by a microcontroller.

III. PROPOSED WORK

To defeat all the disadvantages and meet the necessities of the framework, we propose a system which essentially comprises of a transmitter and a recipient area. In the transmitter area (at the patient side), a two axis accelerometer will be put on the finger of the patient or any part of the body that is capable of movement. This accelerometer is fit for estimating the acceleration due to gravity and consequently finding the angle at which the gadget is tilted. At whatever point patient needs any assistance he tilts the accelerometer in various ways. This will be the input to the accelerometer while output of it is in volts that is associated with the Arduino Uno which goes about as the handling unit. The output of the accelerometer relies upon the tilt direction and is perused by the Arduino Uno. To diminish the complex nature and give a basic path to the patients, we provide a range with front, back, left and right directions. These directions can be effortlessly understood by any individual who is disabled or paralyzedand can be equipped to any part of the body that has motion.

A predefined message taking into account the essential needs of the patients and those required for crisis will be allotted in a particular tilt direction. For instance: water is the message showed when the patient moves his finger to the left. So on tilting the accelerometer to left, it will send its message to the Arduino. In the event that this message lies between the range allocated to the left direction the predefined message that is water for this situation will be sent to the Zigbee transmitter module. The Zigbee transmitter becomes active when a message is sent from the Arduino for transmission. The accelerometer will be associated with every patient and every patient will have a Arduino board and transmitter for sending his messages. To distinguish between various patients their name or number is sent to the attendant. Every one of these transmitters can be associated with one

Zigbee receiver which also works in the same frequency as that of transmitter. In this way the proposed framework will give a many to one communication.

At the recipient side, the Zigbee receiver will receive message from the transmitter and the message will be sent to the Arduino Uno and the same will be displayed on LCD. A buzzer soundseach time when a message is displayed on LCD. On receiving the message, the nurse will take the required actions on the patient. We have also implemented a Bluetooth module at the receiver side to make sure that the nurse receives message on her phone in the form of voice through an Arduino voice controller app that has to be installed on her phone. This system becomes helpful when the buzzer at the receiver side breaks down. The nurse will not be alerted for any message if the buzzer breaks down. With the help of Bluetooth module nurse will be alerted through the voice message received on her phone.

3.1 BLOCK DIAGRAM

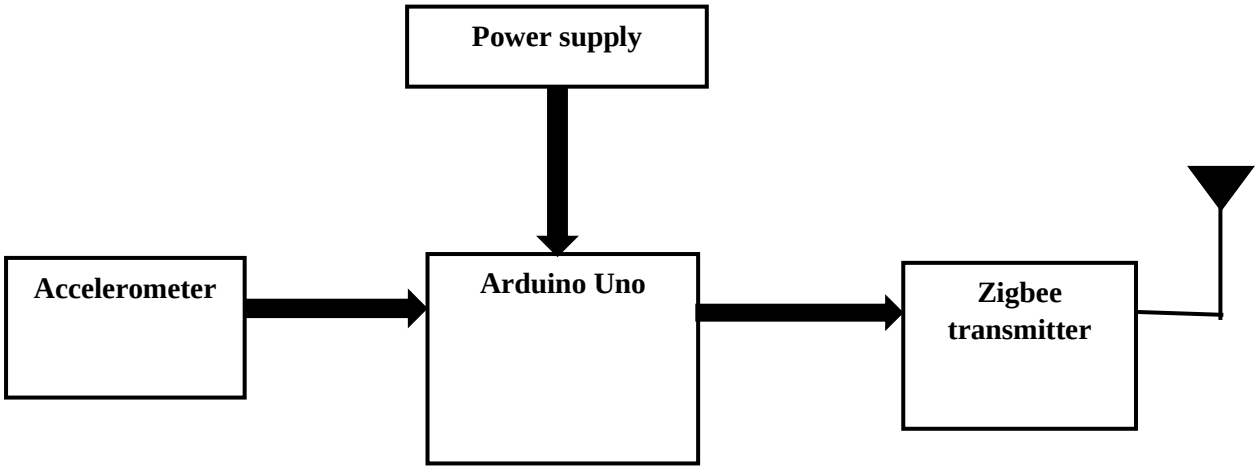

Fig1. Transmitter Block Diagram

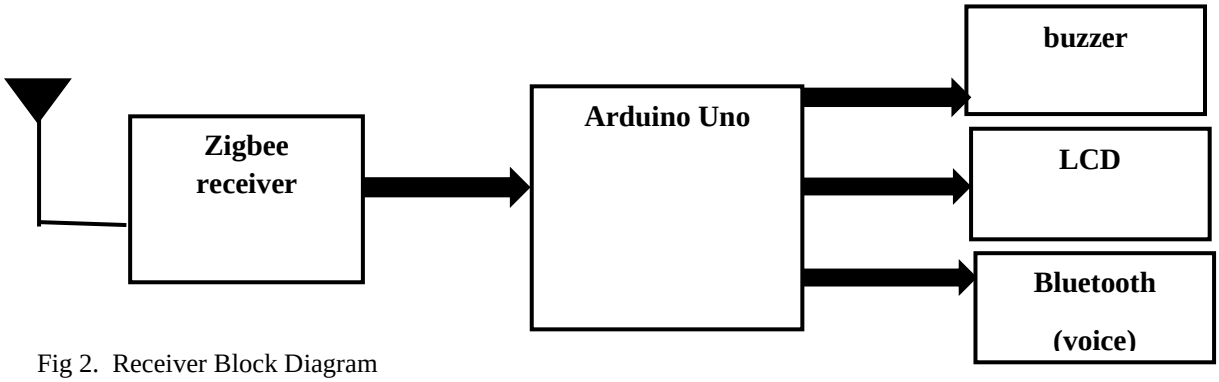

Fig 2. Receiver Block Diagram

International Journal of Advance Research in Science and Engineering
Volume No.07, Special Issue No.07, April 2018
www.ijarse.com
IJARSE
ISSN: 2319-8354

IV. RESULTS AND DISCUSSIONS

Arduino software is employed in the simulation of project.Our framework result indicates fruitful transmission of 4 messages from every patient. When a tilt in some direction from the patient is detected, the buzzer sounds and a predefined message will be displayed on LCD. If the nurse is not near the receiver part, a voice message will also be heard as a substitute to make the life of both patient and nurse easy. This system can also be used for many to one communication wherein each patient will have a unique patient no. and the nurse can easily identify the patient with the help of patient no. sent along with the message.

Fig3. Simulation output seen in serial monitor

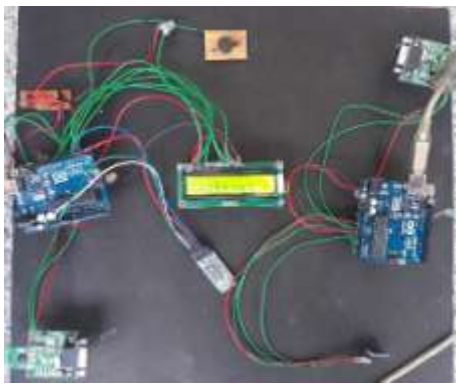

Fig 4.Hardware part of project

V. CONCLUSION

This gadget has made movement of message conceivable just by the movement of a body part. The simplicity of message transport is the primary preferred standpoint of this framework. A basic framework for paralyzed or disabled individuals can be accomplished without the utilization of complex type of information sources. The model we have made is completely useful yet confined to a little territory of activity. For an expansive territory and transmission, the technique utilized must be more successful and faster. Our framework effectively demonstrates that this framework is a phenomenal way to deal with patient-nurse interaction at hospitals. This

module can also be used in homes. The framework can be additionally formed into a programmed wheelchair wherein the wheelchair will be moved just by hand motion. Additionally, alongside just message transmission other information like body temperature, heart rate and so forth can likewise be transmitted to the nurse with the goal that an ongoing record of the considerable number of patients is kept up.

REFERENCES

[1]Shreedeep Gangopadhyay, Somsubhra Mukherjee and Soumya Chaterjee, *Intelligent gesture controlled wireless wheelchair for the physically handicapped,* proceedings of 5th IRAJ International conference, *volume-1, issue-3,* sep-2013.

[2]Ronald Arroyo and B.E .E .E. Clinical Engineer, *Control and communication devices for the severely disabled*, Bioengineering Research Service Veterans Administration Prosthetics Centre 252 Seventh Avenue New York.

[3]Archana JS and K.Gangadharan, *A real time personalized self assistive technology for the disabled people based on voice and EOG.* ARPN journal of engineering and applied sciences, *volume-10, No.17,* September-2015.

[4]YVONNE MAY NOLAN B.E., *Control and communication for physically disabled people, based on vestigial signals from the body*.

[5] S.F.Ahmed, et al., *Electronic speaking glove for speechless patients,* In the IEEE Jaya, Conference on sustainable utilization and development in Engineering and Technology, Petaling Malaysia , 2010, pp.56-60.

[6]Vishnu Vardhan, Penchala Prasad, *Hand gesture recognition for the physically disabled people,* International journal of Science and Research (IJSR), *Volume-3, Issue-8, August 2014.*

[7]Diksha Goyal and S.P.S. Saini, *Accelerometer based gesture controlled wheelchair,* International Journal of Emerging Technologies, *volume-4, No.2, pp.15-20.*