

# Wheelchair controlled by tongue driven system Arduino

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## Abstract

The person who is suffering from disabilities because of spinal cord injuries and they perceive more difficulty in doing their daily routine independently. Some of the assistive devices is required for impaired or paralyzed peoples to communicate or control the activities. Such a case is taken in an account for great consideration, a tongue driven system is developed. In this technique, the major components deserve the hall effect sensors. A system contains the sensors and the magnet which is placed in tissues glue and a tongue. A magnetic field produced that will fluctuate around the mouth.

**Keywords:** Hall Sensor, Arduino At mega, RF module)

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## INTRODUCTION

The wheel chair movement can be done by using tongue direction. These are mainly divided by two segments. They are transmitter segment and receiver segment. Transmitter segment can be placed on headset, and receiver segment can be placed on wheel chair. The tongue driven system can be handled by quite assistive technology. By this technology it helps the people who are struggling with disabilities. The wheel chair uses the Hall Effect sensor to evaluate the direction of tongue in various movements. We can mend this permanent magnet solution by constantly or quickly. By using the tongue driven system it can make constant direction with the maximum degree of movement and it can easily adjustable. It is placed inside the mouth for easy movement and it has benefits.

## RELATED WORK

The paper is implemented by various forms like eye movement based system, voice reorganization system. We can find different types of wheelchairs in the market. For example, head pad controlled wheelchair. But now-a-day's joystick wheelchair are available in the market. The pointer runs in a electronic devices are monitored. An infrared ray shaft is illuminate from the sender which is gathered with end user's glasses, top, or headband. The sensors which are captured the tilt and dynamic pictures are interfaces with computer that can music a facial element. One block of these devices is that best those people whose head movement isn't repressed may benefit of the innovation. In some of the cases the controlling devices may not be turned up, when the user is in incline position or working in front of computer. In some other cases the computer yields the framework from the movements from the reflections by corneal. In that a valid measurement of eye can determined by the Electro Oculographic (EOG) potential measurements have also been used for detecting the eye movements.

## IMPLEMENTATION

In tongue controlling system a small magnet size of wheat placed on the tongue by using tissue adhesive force. The movement of this magnet varies magnetic field of magnet. The magnetic tracer detects variation in magnetic field. The network of magnetic sensors is placed on headset outside the mouth or orthodontic braces inside the mouth. The sensors output transmitted wirelessly personal digital assistant (PDA).The signal processor classifies and converts.

Arduino works as an open source hardware and software company. It can also run by different types of software such as windows OS, MAC OS, and Linux. Steps to dump a code

Open the Arduino software.

- ✓ set up the Arduino port.
- ✓ Type the code.
- ✓ Compile and upload the code and test.

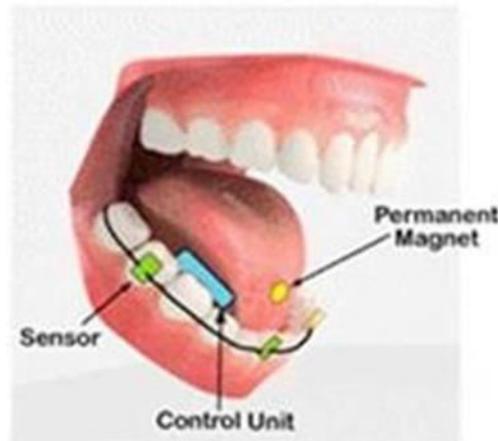


Fig.1 Tongue Driven System

ARDUINO AT mega2560: Arduino mega can be controlled by using the USB cable or by using extrinsic power supply. Power supply can be chosen automatically. Arduino atmega has 256 kb of flash memory, it has 54 digital which can be used as input pins and output pins.

Hall Sensor: The magnetic sensor can converted from magnetic or magnetically encoded data into electrical signals for processes by electronic circuit and, within the sensors and transducer tutorials. Hall sensors are the devices which are operated by the magnetic field. These are having several ways to detect the direction of magnetic field.

RF Module: RF module is a wireless system designer which has two overriding limitations: It must be activate over a definite distance and to shift certain amount of data within a data rate. RF module has voltage range of 3v to 12vand it has a frequency of 433MHz.It consumes low power. In RF module the data can be send serial.

DC Motors: Dc motors will convert the electrical energy into mechanical energy. It has the maximum operating voltage is up to 12v as we have used 60rpm motor. This is used for working of wheels. Motor driver is a module that which controls the two motors at a time. This Motor Driver is designed and developed based on L293D IC. This has 16 pin IC. It will allow the voltage of 5V to 36V.

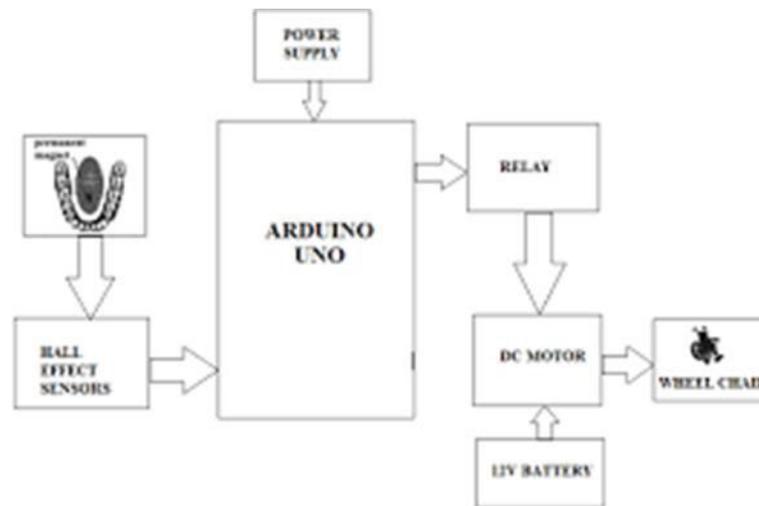


Fig. 2 Block diagram of Tongue Driven System

## RESULTS

This paper is developed for the people who are suffering from spinal cord injuries and quadriplegia since they are paralyzed. They must be able to carry out their day-to-day work independently. In this paper, the designed wheelchair enables the paralysed person to move freely in and out of the homes. Out of three magnetic sensors, when a magnet is placed near one of the sensor, the corresponding movement of the wheelchair take place i.e, left, right and front. Initially, when magnet is not placed near any of the sensor, wheelchair will not have any movement.



Fig 3: System model

Once the connection is established with the help of ARDUINO software and when the magnet is placed near any one of the sensor, out of three sensors the magnetic field is generated. The generated magnetic field is an analog signal and is converted in to digital signal and transmitted to the receiver. The microcontroller is used to drive the motor. When the motor rotates, the wheelchair starts moving to the required direction. Here movement of the wheelchair is controlled by using the magnet.

## CONCLUSION

Tongue Driven System is a newly operated assistive technology which detects the user's intension by tracking their tongue direction by using a magnetic which is attached to the disabled person. It can offer multiple control functions for the users. We can improve some features while designing the system for further implementation processes. we can add features like by using GSM and we can also develop the programmed application to measure the heart rate.

## REFERENCES

1. Mahendra V, A.L.Siridhara, R.Karthik, "Security Methodologies for Electronic Health Record: A Case Study", Journal of Engineering and Applied Sciences, Vol. 12, No. 10, 2017.
2. K Nishanth Rao, Biomedical sensors based remote monitoring system field of medical and health care, Journal of Advanced Research in Dynamical and Control System, 2017.
3. P.Ramesh, J.Chandrasekhar, R.Karthik, Implementation of an adaptive approach for bio medical applications, International Journal of Mechanical Engineering and Technology, Vol 8, No. 7, pp.768-776, 2017.
4. Hochberg LR, Serruya MD, Friehs GM, "Neuronal ensemble control of prosthetic devices by a human with tetraplegis", Nature journal.2006.
5. N. Suzuki, Y. Takeuchi, K. Ishii, "Effects of echoic mimicry using hummed sounds on human computer interaction", Speech Communication, vol. 40, no 4, pp.559-573,2003.