

# Tongue Driven System using 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

## I. 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[1-8]. 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[9-11].

## II. EXISTING APPROACH

The project 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

## III. IMPLEMENTATION

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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, Linux. Steps to dump a code

1. Open the Arduino software.
2. set up the Arduino port.
3. Type the code.
4. Compile and upload the code and test.



Fig.1 Tongue Driven System

### i) ARDUINO ATmega2560 :

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.

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## ii) Hall Sensor:

The magnetic sensor can be converted from magnetic or magnetically encoded data into an electrical signal 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.

## iii) RF Module :

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

## iv) 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**

## IV. RESULTS

This project 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 project, the designed wheelchair enables the paralyzed 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 takes place i.e., left, right and front. Initially, when a magnet is not placed near any of the sensor, the 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 into a 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

## V. CONCLUSION

Tongue Driven System is a newly operated assistive technology which detects the user's intention by tracking their tongue direction by using a magnetic field 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.

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