

## Tongue Drive System to Operate Computer Functions

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[www.ijcseonline.org](http://www.ijcseonline.org)

Received: 15 Feb 2014

Revised: 22 Feb 2014

Accepted: 26 Feb 2014

Published: 28 Feb 2014

**Abstract**— Tongue Drive System(TDS) is the assistive technology plays very important role in the life of people who are suffered from spinal cord injuries those are unable to do their own tasks or for those who have central nervous system disorders. Assistive technologies help them to leave their life without help of others. These papers provide the more brief report about the various assistive technologies which has been developed for disabled people. The tongue is considered as an excellent limb for handle the devices. The magnetic read relay mounted on outside of teeth to sense the message, which small magnet generated. These sensors signals are transmitted across wireless medium and processed to operate the wheelchair. The main Moto behind this technology is the possibility of capturing large number of moments. This paper gives advanced technology to operate the computer functions with the help of tongue and using small magnet sensors to make the people employable and independent.

**Index Term**— Assistive Technologies, Spinal Cord Injuries, Computer Commands to Access Computer Function, Permanent Magnet, Tongue Control Magnet Read Relay, TDS.

### I. INTRODUCTION

Tongue drive system (TDS) is the assistive technology is used to enable the people to their own work and also enable other devices, such as wheelchair and also computer system [1]. Tongue drive system (TDS) is used for those people who have the several disabilities such as spinal cord injuries or the person who suffered from paralysis attack to live their life without help of other people or relatives and also help to their everyday task and communicate to other and also control their environment.

Tongue drive system (TDS) consist of small magnet of size 1to 1.3mm which is attach the tongue with the help of adhesive tissue or gum. To Perform the operation. TDS also uses the magnetic read relay to sense the movements [3]. It is one type of sensor which transfer the movements from transmitter side to the receiver side with the help of wireless medium to establish the successful connection between the transmitter and corresponding computer or smart phone to transfer magnetic sensed data [2]. The current TDS uses the six corresponding commands to handle the wheelchair and which are easily operate the injured person from the above six command four command are to indicate direction. That is LEFT, RIGHT, UP and DOWN an remaining two commands are used for selection purpose [2].

Command1 (LEFT): used to take left turn.

Command2 (RIGHT): used to take right turn.

Command3 (UP): used to move up word direction.

Command4: (DOWN): used to move downward direction.

Command5: used for selection purpose.

Command6: used for selection purpose.

A set of head mounted assistive device has been developed for to control the mouse with the help of head movement and also cursor movement are control by tracing infrared beam emitted from transmitter. or reflector attached to the clothes of person or head band cap.

Today there are more technologies are developed such as to track the facial movements to perform specific operation. This system has limitation such as these technologies useful for only those people who are not able to move their head. Another limitation is that person head should always be in position within the range of device. For example controller may not be accessible when person not place in front of computer.

Another category to handle computer to handle computer system is taking eye movements, but this technology also has the limitation. To study all this technology an understanding the disadvantages of the system may be

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gnovanloo invents the new technology Tongue drive system(TDS) which is operated with the help of tongue to perform fast operation because tongue is directly connect to the brain with the help of cranial nerves.

## II. TONGUE DRIVE SYSTEM OVERVIEW

In the tongue drive system, the motion of the tongue is seen with the help of the magnetic sensors, which is used to measure the magnetic field which is generated around the small magnet which we have use in it. Magnetic sensors like magnetic read relay are placed outside the teeth to measure the generated magnetic field with different views to generate an analog output. Figure 1 shows the two unit one is placed inside the mouth and other unit is outside which is fitted to heel mate or clothes of the user. Small batteries are used to power the unit which is place inside the mouth. The time division multiplexing that is TDM is used to modulate the analog output. This output is transmitted to the second unit which is placed outside the mouth.

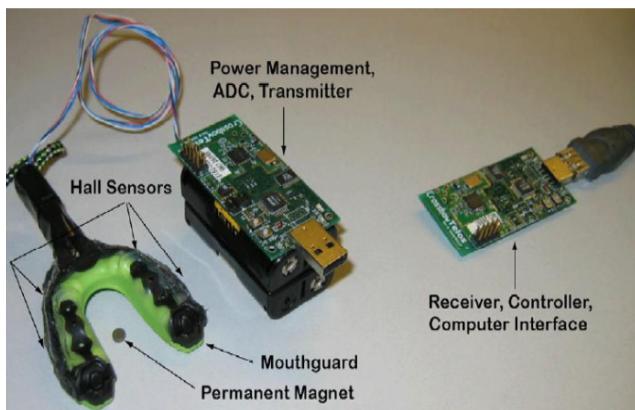


Fig.1 TDS Overview

The signal is receive by the external unit are demodulated to sense the exact output. Processing the output the actual action within the mouth is seen by assigning a same command to this action is done in software. These assigning commands can be used to operate different function like wheelchair, computer functions, bed movements and many others.

## III. WHY TONGUE IS USE

The Tongues and mouth consist of an sensory and motor cortex that are connected to finger of hands, therefore the finger of hand capable of doing manipulation task [10].

The tongues and mouth consist of an sensory and motor cortex that are directly connected to the brain and also brain consist of cranial nerves which are capable of removing any injury of spinal cord [11]. Tongue is very simply moved inside the mouth. one similarity in tongue and heart is that they have same muscles [12].The tongue drive system has an privacy that the tongue is placed inside the mouth therefore there is no problem of any disorder.

The tongue is not moved according to the body movement it moved according to the users comfort. Therefore there are many inventions are take place with considering the tongue [13].

## IV. RESULT

The first Tests of Tongue Drive System to Operate Computer functions using the Movement of the tongue is successfully done. Multiple functions we can handle in it like to operate Windows media player, SMS Sending, Emergency Buzzer and more. These Functions are done as more efficiently no much more Time span is required for this.

After testing the tongue drive system to operate computer function or to control wheelchair. It is notice that the person with several disabilities can do their own work. we have successfully completed one trial with it that, the individual having spinal cord injury do their own work with the help of wheelchair and also operate the computer functions more efficiently.

## V. FUTURE SCOPE

The research team has also start to develop software to connect the Tongue Drive system to a wide variety of readily available communication tools such as text generators, speech synthesizers and readers.

Also the researchers plan to add control commands, such as switching the system into standby mode to allow the user to eat, sleep or engage in a conversation for extending the battery life. Also in future it is useful for to handle the phone, TV, Bed, Table lamp and many other applications.

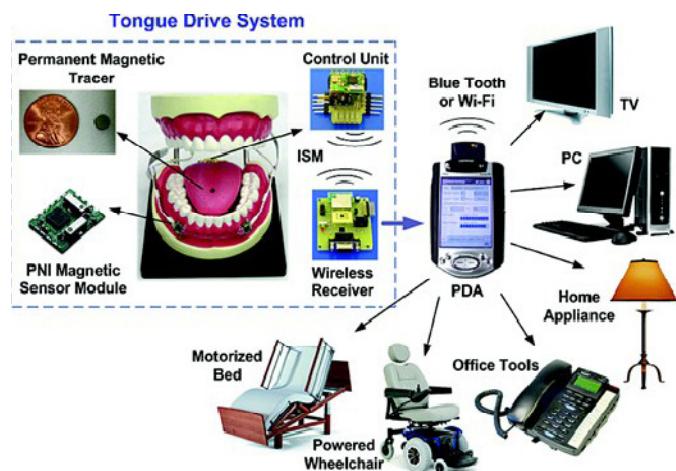


Fig.2 Future Technology

## VI. CONCLUSION

Tongue drive system is the wireless assistive technology has been develop for the people having several disabilities such as spinal cord injuries to lead self supporting independent life by enabling then to control their activities with the help of the tongue. This technology works on the

tracking the movement of the magnet which sense the touch and send it to the magnetic sensor like magnetic read relay. Thus this system provides a fast, smoother control as compared to the other existing assistive technology. More advanced researches related to tongued

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