

Review on Electro-oculography based Assistive Interaction Device

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Abstract: - Human brain mainly works on electric signals transmitting all over the body to send the information in order to operate the body parts. Even while rotating eye ball body increases or decreases the resistance near eye area. This variation in electric signals can be measured using EOG dry electrodes. A brain-computer interface (BCI) in a set of hardware devices to reach an interface human brain/computer. This new communication channel only uses brain waves; consequently, it is particularly suitable for Paralyzed person. This project will help paralyzed person to overcome their problem by communicating with doctors through EOG based device.

Key Words: *Electrooculogram, natural eye movement detection, EOG acquisition, Signal Conditioning.*

I. INTRODUCTION

Life of disable patient can make more cozy with the help of Assistive Technology. Many researcher are doing research for different kind of assistive devices for disable or paralyzed patients. Due to different assistive device available the life of patients change from dependent to self dependent that is they live autonomous lifestyle. Progress in the world of computer also make easy to develop computer handling application. Taking into consideration the increase in number of disable or paralyzed person the need of Human Computer Interface is important to make standard of living more convenient.

The Interface that provide control by using computer is called as Human Computer Interface. Various advance in embedded and sensors technology made easy to design different assistive devices. Cost effective device are develop due to advance in technology.

Human computer interface based new low cost system has designed especially for the paralyzed person with only eye motor coordination. This system provides the use of eye movement with limited motor control, which helps in communication because of its modularity and this system has various application as this device is made of low cost as shown in paper[1].

EOG based system is made with the help of cornea retinal potential. On the basis of cornea retinal potential in paper [2] presents different gestures that help speech disable person to convey that message to their colleague as shown in paper [2]. In paper [8] the virtual keyboard is presented through which patient can communicate with the doctors with the eye movement. The system made in this paper can be used to maintain the signal originality and the noise reduction. In paper [4] the different EOG signals are noticed for different person for same threshold value. For real time application use the position of electrode should be constant. In paper [5] the contact impedance of

electrode with skin interface and the corresponding noise characterization has been presented.

II. RELATED WORK

In Electro-oculography much more work has been carried out. The different research is done with EOG technique in order to use it with different real time application.

Paper [1] presents the different test has been done with the EOG system. The first test in this paper is to check the eye movement directions. The paper also shows the interface of human computer with EOG system .The paper shows the different angle of eye movement depend upon the vertical and horizontal direction.

Paper [2] presents the concept of verifying different character with the help of MATLAB software. The algorithm is plot for particular letters suppose 'C' with the eye movement of two different people. It is observed that the signals generated by both the person are same. This Signal is passed to the MATLAB based character recognition to verify the shape of the alphabet. The MATLAB verify the signal and shows the same result.

Paper [3] shows the new concept for communication of disable people with the help of virtual keyboard. The typing of the word is done via virtual keyboard with the help of different potential difference generated by eye movement studied in paper [2]. In this paper, we also study that the CMRR should not be greater than 80 db. For maintaining CMRR greater than 80 db Instrumental Amplifier is used.

Paper [4] shows the different EOG signal for different threshold value .The position of electrode should be standard as different position of electrode result in different output voltage. The paper also shows the GUI of different activities and with the

help of eye movement different option in GUI is selected.

Paper [5] shows the different electrode characteristics. This electrode is tested in same measurement setup. The result indicates that different electrodes provide different result.

III. PROPOSED WORK

The proposed system can be used by disable or paralyzed person to communicate with the doctor with the help of EOG technique. The proposed system shows the message which patients want to convey to the doctor.

IV. CONCLUSION

The EOG technique which is reviewed through this review paper such as EMG, EEG, and ECG. From the review paper it is reviewed about EOG which shows that EOG can work better as assistive device for disable person as reviewed through this paper. From referred paper it seems that EOG and HCI is having very wide scope in future.

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