Abstract

This project describes a non-invasive Brain-actuated Wheelchair which acquires thesignals from various electrodes placed according to the International 10-20 electrode setup for Electroencephalograph (EEG). The brain signals are processed to determine the direction of the movement of the wheelchair. It has been shown that the patient is able to achieve EEG controlled cursor, limb movement, a prosthesis control and even has successfully communicated by means of a Brain-computer Interface (BCI). The signals are detected to observe the path to estimate the movement of the wheelchair. The specific signals have been observed for the sensing of the left and right directions. A very prominent disturbance has been observed in the signal from P3 and T5 electrodes for the left turn signal and a similar disturbance is observed for the P4 and T6 electrodes for the right turn signal. The work presented here mainly uses simple unipolar electrode to capture EEG from the forehead to build a control for electric wheelchairs through Bluetooth for paralyzed patients. We have normalized β, α, θ and δ waves to construct two signals such as meditation and attention.

Additionally, we can also extract the eye-blinking signals from BCI.Therefore, attention and eye-blinking signals can be collected as the control signals through a Bluetooth interface and an electrical interface is used for the electric wheelchair.

Brain-computer interfaces (BCI) do not rely on muscular activity and can therefore provide communication and control for people with devastating neuromuscular disorders such as the amyotrophic lateral sclerosis, brainstem stroke, cerebral palsy

and spinal cord injury.

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