ERROR-RELATED POTENTIAL -IN BRAIN-ACTUATED WHEELCHAIR

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Abstract. The Purpose of noninvasive brain-computer interfaces (BCIs) is to provide a communicative and controlled channel based on the spatiotemporal neural activity such as EEG. But, BCI systems are prone to have errors in identification of human purpose. One of the existing methods to improve the performance of BCI systems is a verification procedure based on appearing error-related potential (Errp) in the electroencephalogram (EEG) just after errors. In this work we have simulated a brain- actuated wheelchair and explored whether Errp follow a feedback indicating incorrect response of the BCI system. 10 healthy male subjects with no prior BCI experiment participated in our interaction experiment. They were asked to send a mental command and move a square shape on the screen. These experiments were performed with two different error rates on square movement direction. As a result of this procedure, the interaction Errp and its related characteristics have been confirmed and reported as a conclusion of this work.