



Detecting the Direction of Motor Imagery Using Brain Signals

Zahra Bagherian^a, Abbas Erfanian^a

^a Iran University of Science and Technology, Iran

Brain Computer Interface (BCI) systems provide a direct communication channel between the brain and machine. Most BCI systems are based on mental activity. Different types of mental activity such as, e.g., imagination of left-hand, right-hand, foot movement, tongue movement, and mental arithmetic task were considered in designing BCI. In this work, the relationship between direction of movement and EEG signals during hand movement imagination has been investigated. It was shown that the direction of imagined movement can be inferred from noninvasively recorded brain signals. Different experiments were conducted on three healthy human subjects. Common spatial pattern (CSP) was used to extract features. Probabilistically neural network (PNN), Support vector machine (SVM), and perceptron (P) are used to classify features. The results shows that the brain signals associated with the imagination of left and right direction (i.e., 2 classes) can be discriminated with 80.42% accuracy and the brain signals associated with the imagination of left and right direction and idle state (i.e., 3 classes) with 76.40%.