Brain Machine Interface: Motor Imagery Recognition With Different Signal Length Representations

Abstract

This work investigates how signal representations affect the performance of a motor imagery recognition system, specifically we investigate on recognition accuracy and computational time of a brain machine interface designed using motor imagery. Experiments show that the signal length should not be larger than a critical range for good recognition accuracy. The results presented here is a part of our work on the design and development of a brain machine interface to operate a wheelchair. EEG motor imagery signals recorded from the motor cortex area using non-invasive electrodes, are used for recognition of four tasks namely, left, right, forward and stop. Experiments are conducted for 12 signal representations from signal lengths varying from 3s to 0.25s. From the results it is observed that good recognition accuracies (93.2% -94.2%) are obtainable for 2s to 3s signal representations.