Task 6 or Task 7
Implementation of a brain computer interface to classify between two motor activities

1 Instructions

For the assignment, you must also write a report of one A4 page in .pdf format. The report should follow the standard form of the expert report in the IMRD (Introduction, Methods, Results, Discussion) form.

When you have completed the task, submit one .zip file containing:

- program code,
- report in .pdf file.

2 Description of seminar task

For a selected subject from the EEGMMI DS database (during left and right hand activities, or during imagined left and right hand activities, or during other selected activities) estimate the threshold for classification between the two activities. In order to extract features in the component space, the signals should be first filtered using a selected spatial filter. For the selected spatial filter select ONE of the following options: small or large Laplace mask (LM, 55 points), or Common Spatial Patterns (CSP, 60 points). After that, the obtained signals in the component space should be filtered using a selected band-pass FIR filter from 8.0 Hz to 13.0 Hz, or from 8.0 Hz to 30 Hz. To generate feature sets of both classes in the component space use the Var and log functions. For the classification use Linear Discriminant Analysis (LDA) classifier, or another selected classifier, (implementation of a classifier brings you next 5 points). If you enhance your feature vectors by the features obtained from the power spectra of the signals, i.e., by the coefficients by the autoregressive (AR) method, you get another 5 points.