Machine Learning and Analysis of Neural Data

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Exercise Sheet : Dimensionality reduction 1. 29.06.22

Exercise 5.

Load segment of LFP (16 channels, 50 -100 seconds). Apply ICA decomposition using FastICA to raw LFP.

a. Plot spatial profile of IC loadings, matrix A, compute CSD ($-d^2A_k(x)/dx^2$) for columns of A (spatial loadings) and plot activations timeseries *s* for the first K components. Compute and plot power spectra/ of the activations in the theta and gamma range.

b. Find component(s) that are EMG candidates – high frequency spectrum peak (>200 Hz) & uniform loading. Clean the signal (remove EMG component) and compare the spectra for one channel before and after.