Home Assignment 1A (classification)

-Download EEG data (S1.mat)

-Data description is given in pdf file “Kaneshiro_etAl_objectCategoryEEG_README.pdf”

-Data (**X_3D**) : 124 (channels or features) X 32(time points) X 5188 (trials)

-**categoryLabels** (class labels): 1 X 5188 (trials)

-Do dimensionality reduction (PCA, retain 95% of variance) and normalization of data

- Classification Task

- Do this classification as a function of time (32 time points)
- Perform binary classification between human face (class label==2) vs. Inanimate Object (class label==6)
- Perform multiclass classification (6 classes)
- Evaluate performance using 10-fold cross-validation

-Plot the accuracy against time

Home Assignment 1B (auto-encoder/regression)

-Download MEG data ('SUB_100307_S2.mat')

- **D**: 240 (channels or features) X 2035 (time) X 124 (trials)
- Rearrange **D** to **D2**: 240 X (2035*124): (features X observations)
- Do z-normalization of **D2**

PCA

- Do dimensionality reduction (PCA, retain 95% of variance)
- Re-project your PCs (**m** number of PCs) data to original dimension using only retained PCs
- Compute RMSE (between re-projected and original data)

Auto-encoder

- Train Auto-encoder (MLP) with **m** number of neurons in bottle-neck layer
- Compute RMSE (between MLP outcome and original data)