2009-09-13 GAIT2 PROJECT - HOW TO PLOT

Technical tutorial on generating figures. Everything is done in MATLAB.

Load data

- Download a mat file from http://featureserver.bme.uci.edu/~bcilab/data/gait2/analysis protocol 20090828
- 2. Drag mat file to MATLAB, or use the load command
- 3. You should have loaded **rawdata_m1m2**, **labels**, and **ChanNames**. *rawdata_m1m2* is (chan, time points, trials). Inside *trials*, 0 is standing still (idle), 1 is left step, 2 is right step.

Feature extraction matrix - DO NOT SKIP THIS SECTION

```
TrainData = rdreshape(rawdata_m1m2); % Reshape the data (collapse channels and time points).

TrainLabels = labels > 0; % This is for idle vs move.

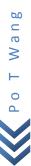
Fdim = 1; % Set the feature space dimension

[trfmat, Ftrain, Flabel] = cpca_aida(TrainData, TrainLabels, Fdim); % Uses CPCA + AIDA

**Note: Use cpca_Ida instead of cpca_aida for LDA.
```

Filter image

Advanced usage - Plot filter image based on your own feature extraction algorithm



EEG Topographic Map

%Obtain **trfmat** first. Use filter image to find out on which filter and at which time point you want to plot a topography map.

%The following example plots topography map on the first filter (subspace 0) at time point number 1. TimePoint = 1; % Time sample point to plot. Specify one time point only. Nchan = size(rawdata m1m2,1); % Number of channels. for s = 1:length(trfmat); Filter{s} = reshape(trfmat{s},Nchan,[]); end; % The for loop reshapes trfmat to (chan, time) format eeg topoplot(Filter{1}, ChanNames, TimePoint); % Plots first filter topography.

To plot more than one time points and save as FIG files:

```
Fs = 512:
eeg topomultiplot(Filter{1}, ChanNames, Fs, [1 2 10 20], 'Idle vs Move');
%plots the first filter and saves time points 1, 2, 10, and 20. Prefix file name by "Idle vs Move"
```

Feature space

%Obtain **Ftrain** and **Flabel** first. The following function can automatically plot the feature space up to 3 dimensions.

plotfeaturespace(Ftrain{1},Flabel,'o+','br');

%plots feature space based on subspace 0, using blue circles for class 0, red crosses for class 1.

