BE M260/EE M255/NS M206

Neuroengineering, Fall 2023

Final Term project (phase II) grading criteria

I. Matlab code (400 points)

1) Each section will be graded individually according to the accomplishment
2) The codes must be organized as specific sections by "%%". Sections must include
    a. Input file (50 points)
    b. Filter signal (50 points)
    c. Detect spikes (50 points)
    d. Align spikes (50 points)
    e. Extract features (50 points)
    f. Cluster spikes (50 points)
    g. Classify spikes (50 points)
    h. Analysis (50 points)
3) Detailed comments are required in all sections
4) Each section has to be able to be a) executed individually and b) generate the input/output figures. The figures have to be well titled
5) Sufficient comment in code will seriously impact the grading
6) **Grading criteria for each section: CORRECT execution (40 points), readability (10 points)**
7) The beginning of the first section "Input file" should be as follows:

```
%% Inputfile
M= csvread('EMG_example_2_fs_2k.csv'); %read in csv file
time= M(:,1); % first column is the time series
fs= (time(2)-time(1))^-1; % calculate the sample frequency
channel_number= size(M,2)-1; % num of channels in the database
for i=1:channel_number,
   figure('Color',[1 1 1]);plot(time,M(:,i+1)); %plot each channel
   str= sprintf('Channel %d',i);
   xlabel('seconds');title(str);xlim([time(1) time(size(time,1))]); % label and title each plots
end
channel_select= 1; % select channel for testing. channel_select<= channel_number
test_input= M(:,channel_select+1); % test_input will go through all the individual sections
```

Note:

1. The test file and channel can be randomly assigned (out of four channels) for grading evaluation.
2. For debugging purpose, additional file – "*EMG_example_1_90s_fs_2k.csv*", you will have to type in the sample rate fs=2000 and arrange the time series accordingly.

II. Report (100 points)

1) Use ***PowerPoint format***
2) Introduction/Method description (20 points)
3) Results and figures of 8 building section for 3 test databases (40 points)
4) Discussion of the results of each section and conclusion (40 points)
5) Avoid long and tedious description and focus at important points

III. Bonus (Each up to 100 points)

1) Advanced features/analysis methods, and extensions
2) Outstanding performance
3) Best 3 projects of the class