**Perceive Medtronic-CU Anschutz Collaboration**

Part 1: Import all necessary values and create global variables.

%% loads in json file

%loads in file

cd('C:\Users\sydne\Documents\github\perceive\patientData\Patient1\_0524')

jsonFiles = 'Report\_Json\_Session\_Report\_20210524T101039.json';

js = jsondecode(fileread(jsonFiles));

%sets it back to the path where all the other functions are

cd('C:\Users\sydne\Documents\github\perceive')

%declares "global" variables AND determines if .json comes from

%single or double battery B)

channels = unique({js.LfpMontageTimeDomain.Channel}, 'stable');

leng = numel({js.LfpMontageTimeDomain.Channel});

startindex = 7; %MUST BE MANUALLY SET IN CLINIC

sides = {'LEFT', 'RIGHT'};

if any((contains(channels, sides{1}))) && any((contains(channels, sides{2})))

doubleBattery = false;

%json has both left and right data

channelsLeft = channels(contains(channels, sides{1}));

channelsRight = channels(contains(channels, sides{2}));

channelSides = {channelsLeft, channelsRight};

highestBetas = {' ', ' '};

else

doubleBattery = true;

%added this to help with titling figures

if contains(channels, sides{1})

side = 'LEFT';

else

side = 'RIGHT';

end

end

Part 2: Create freq vs pwr plot for all 6 contacts. Also reports the max betas.

%% run to get full graph

%{} gets the thing from the actual cell array

%() gets cell ARRAY!

close

if doubleBattery == false

%this should be true if the json returns both left and right data,

%single battery

for i = 1:2

subplot(2, 1, i)

channels2 = channels(contains(channels,sides{i}));

colors = 'krbgmc';

maxValues = zeros(length(channels2), 1);

for c=1:length(channels2)

maxValues(c) = tempAvgPlot(startindex, leng, js, channels2{c}, colors(c));

hold on;

end

[M, I] = max(maxValues);

highestBeta = channels2{I};

highestBetas{i} = highestBeta;

%add all the plot info

xline(13);

xline(30);

%formats the channels to be suitable for the legend

legendChan = cell(6);

oldchar = {'LEFT', 'RIGHT', '0', '1', '2', '3', '4', '5', '\_', 'AND'};

newchar = {''};

oldnum = {'ZERO', 'ONE', 'TWO', 'THREE'};

newnum = {'0', '1', '2', '3'};

for b = 1:length(channels2)

legendChan{b} = replace(channels2{b}, oldchar, newchar);

legendChan{b} = replace(legendChan{b}, oldnum, newnum);

end

legend(legendChan{1}, legendChan{2}, legendChan{3}, legendChan{4}, legendChan{5}, legendChan{6})

title(["Freq vs. Power (db)", sides{i}, legendChan{I}])

xlim([0 60])

xlabel("Frequency")

ylabel("Power")

disp(['The highest beta comes from contact pair ', legendChan{I}])

end

else

%should be true if a double battery

x = 0;

%leng = numel({js.LfpMontageTimeDomain.Channel});

%channels2 = channels(contains(channels,sides{i}));

disp(["The following information is for the", convertCharsToStrings(side)]);

colors = 'krbgmc';

maxValues = zeros(length(channels), 1);

for c=1:length(channels)

maxValues(c) = tempAvgPlot(startindex, leng, js, channels{c}, colors(c));

hold on;

end

[M, I] = max(maxValues);

highestBeta = channels{I};

%add all the plot info

xline(13);

xline(30);

%these are the order presented in channels

legendChan = cell(6);

oldchar = {'LEFT', 'RIGHT', '0', '1', '2', '3', '4', '5', '\_', 'AND'};

newchar = {''};

oldnum = {'ZERO', 'ONE', 'TWO', 'THREE'};

newnum = {'0', '1', '2', '3'};

for b = 1:length(channels)

legendChan{b} = replace(channels{b}, oldchar, newchar);

legendChan{b} = replace(legendChan{b}, oldnum, newnum);

end

legend(legendChan{1}, legendChan{2}, legendChan{3}, legendChan{4}, legendChan{5}, legendChan{6})

title(["Freq vs. Power (db)", legendChan{I}])

xlim([0 60])

xlabel("Frequency")

ylabel("Power")

disp(['The highest beta comes from contact pair ', legendChan{I}])

end

Part 3: Compare beta values with stds across contacts

if doubleBattery == false

for i = 1:2

disp(['Max Betas ', sides{i}])

compareBetaBarChart(startindex, leng, js, channelSides{i});

figure;

end

else

compareBetaBarChart(startindex, leng, js, channels);

end

Part 4: Show table of data across each run

if doubleBattery == false

for i = 1:2

disp(['Table of means and stds per channel ', sides{i}])

maxMeanBetaAllRuns(startindex, js, leng, channelSides{i});

figure;

end

else

maxMeanBetaAllRuns(startindex, js, leng, channels);

figure;

end

Part 5: Show all frequency data for contact pair that provides highest beta

figure;

if doubleBattery == false

for i = 1:2

disp(['All frequency data for ', legendChan{I}, sides{i}])

allFreqBarChart(startindex, leng, js, highestBetas{i});

figure;

end

else

allFreqBarChart(startindex, leng, js, highestBeta);

figure;

end

Part 6: Show variability between trials for each pair

%graphEachTrials(startindex, js, leng, channels);

figure;

if doubleBattery == false

for i = 1:2

disp(['Trial variability for the ', sides{i}])

graphEachTrials(startindex, js, leng, channelSides{i});

figure;

end

else

graphEachTrials(startindex, js, leng, channels);

figure;

end