How to run the PCD\_CDC\_Location\_Comparison\_95\_CI script

\*\*First, you need to make the PCD and CDC excel files to input when using the script.\*\*

1. The raw data of the x and y coordinates for the PCD and CDC will output from the PCD & CDC analysis script on the analysis summary spreadsheet:

A screenshot of a computer

Description automatically generated

* 1. Column C: PCD x coordinate
  2. Column D: PCD y coordinate
  3. Column H: CDC x coordinate
  4. Column I: CDC y coordinate

1. You will have to combine the results from running the PCD & CDC Analysis script for all 10 window sizes. Make a spreadsheet that looks like this:

A screenshot of a computer

Description automatically generated

* 1. The top row with be the subject ID in the first column.
  2. The first 10 rows will be all of the x values of PCD coordinates. Each row corresponds to one window size.
     1. Ex: “5 wind 1x” is the x coordinate PCD from the 5 cone window. “200 wind 10x” is the x coordinate PCD from the 200 cone window.
  3. The second 10 rows will be all of the y values of the PCD coordinates.

A screenshot of a computer

Description automatically generated

* 1. **It is important to keep the x coordinates separate from the y coordinates and to keep all of the PCD coordinates separated from the CDC coordinates.**

1. The next step is to multiply the mpp conversion by the raw pixel value for each of the x and y coordinates. You are converting the pixels output of the location into microns.

A screenshot of a computer

Description automatically generated

* 1. Ex: for the value 126.4556, I multiplied 485 (the pixel location of the x coordinate) by 0.26073 (the microns per pixel conversion)
  2. Repeat this for the y coordinates.

A screenshot of a computer

Description automatically generated

1. You are making an ellipse in a 300x300um graph where the x and y axis ranges are -150 to 150. Because of this, you need to offset the microns version of the x and y coordinates by 150 so the resulting ellipse will be based off the 0,0 center of the graph you are putting it into.
   1. For all of the **x-coordinates** use the following equation:
      1. (X-coordinate in microns) – 150
   2. For all of the **y-coordinates** use the following equation:
      1. 150 – (y-coordinate in microns)
   3. You need to reverse the equation for x and y coordinates because Matlab puts (0,0) as the top left corner of an ROI.

A screenshot of a computer

Description automatically generated

* 1. -23.5444 (1X) was calculated by taking 126.4556-150
  2. 6.336 (1Y) was calculated by taking 150-143.6639

1. Make sure your table is organized like the picture above.
   1. Numbers 1-10 are each sampling window size
   2. The Xs and Ys are the adjusted X and Y coordinate values that will be in the inputs for this script.
   3. Each row is one subject.
   4. Copy and paste the columns of adjusted X and Y coordinates into a separate excel doc. Save as a .csv and title it “PCD\_Table”
2. Repeat steps 1-5 with the CDC data.
3. Running the script:

A screenshot of a computer

Description automatically generated

* I copied the PCD and CDC csv files into the folder with the matlab script. Ignore the three output folders…this is what happens when you run the script but they aren’t there to begin with.
* When you run the script, it will have you select the folder containing the script, then the PCD file, then the CDC file.
* Before it runs, it will ask you if you want to scale globally – SELECT YES
* Then the script runs and makes these 95% ellipse contours which combines all of the locations from all of the observers for each subject

A graph of a diagram

Description automatically generated

1. If you want to confirm the script is running correctly:
   1. From the PCD & CDC Analysis script results drag this file into photoshop: 288377530\_bounddensity\_matrix\_13-Nov-2023.csv\_bestFitEllipse\_marked
      1. You will have to overlay all 10 of these from all 10 window sizes.
      2. Change the opacity of the layers so you can visualize all the points from all of the layers
      3. Go to View > New guide.
         1. Open the \_bestFitEllipse\_marked tif in ImageJ. Divide the pixels size of the tif in half and make a vertical and horizontal guide that that size

A screenshot of a computer

Description automatically generated

* 1. Then drag in the graph from the 95% CI comparison script on top of the layers from the PCD & CDC analysis script
     1. Adjust the size of the graph so the black outline boundaries are the same size as the size of the tifs from the PCD & CDC analysis script
     2. Hide and unhide the graph layer to see if all of the points are in the right spots and if the confidence ellipses are oriented correctly.

A screen shot of a grey and blue screen

Description automatically generated