```
%-- 11/16/20, 12:10 AM --%
ft_read_cifti_mod↙
('/Users/dianaperez/Box/Quest_Backup/HCP_analyses/from_Ben/HCP_variants/spCorr/100206_all↙
Runs_mean_vs_120_avg_corr_LR_corr.dtseries.nii')
help MRIread
%-- 11/16/20, 1:04 AM --%
ft_read_cifti_mod↙
('/Users/dianaperez/Box/DATA/HCP/CIFTI/bold_data/100206_rfMRI_REST1_LR_surf_subcort_norma↙
lwall.dtseries.nii')
unique(ans.brainstructure)
cifti = ft_read_cifti_mod↙
('/Users/dianaperez/Box/DATA/HCP/CIFTI/bold_data/100206_rfMRI_REST1_LR_surf_subcort_norma↙
lwall.dtseries.nii')
ft_read_cifti_mod↙
('/Users/dianaperez/Box/Quest_Backup/HCP_analyses/from_Ben/HCP_variants/spCorr/100206_all↙
Runs_mean_vs_120_avg_corr_LR_corr.dtseries.nii')
unique(ans.brainstructure)
%-- 11/16/20, 1:33 AM --%
help MRIread
ft_read_cifti_mod↙
('/Users/dianaperez/Box/Quest_Backup/HCP_analyses/from_Ben/HCP_variants/spCorr/100206_all↙
Runs_mean_vs_120_avg_corr_LR_corr.dtseries.nii')
addpath '/Users/dianaperez/Box/Dependencies/cifti-matlab-master'
ft_read_cifti_mod↙
('/Users/dianaperez/Box/Quest_Backup/HCP_analyses/from_Ben/HCP_variants/spCorr/100206_all↙
Runs_mean_vs_120_avg_corr_LR_corr.dtseries.nii')
cifti = ans
unique(cifti.brainstructure)
lhem = cifti.data(cifti.brainstructure==1);
rhem = cifti.data(cifti.brainstructure==2);
find(cifti.brainstructure==2_
find(cifti.brainstructure==2)
rhem = cifti.data(cifti.brainstructure==2);
roi_data = load_untouch_nii_wrapper↙
('/Users/dianaperez/Box/Quest_Backup/Atlases/Seitzman300/Seitzman300_MNI_res02_allROIs.↙
nii.gz')
addpath '/Users/dianaperez/Box/Dependencies/cifti-matlab-master'
roi_data = load_untouch_nii_wrapper↙
('/Users/dianaperez/Box/Quest_Backup/Atlases/Seitzman300/Seitzman300_MNI_res02_allROIs.↙
nii.gz')
addpath '/Users/dianaperez/Box/Quest_Backup/Scripts'
roi_data = load_untouch_nii_wrapper↙
('/Users/dianaperez/Box/Quest_Backup/Atlases/Seitzman300/Seitzman300_MNI_res02_allROIs.↙
nii.gz')
cd '/Users/dianaperez/Documents/GitHub/GrattonLab-General-Repo/FCProcess'
roi_data = load_untouch_nii_wrapper↙
('/Users/dianaperez/Box/Quest_Backup/Atlases/Seitzman300/Seitzman300_MNI_res02_allROIs.↙
nii.gz')
unique(roi_data)
brain = cifti.brainstructure(cifti.brainstructure>0)
lhem = cifti.data(brain==1);
rhem = cifti.data(brain==2);
unique(lhem)
map = ft_read_cifti_mod↙
('/Users/dianaperez/Box/Research/lateralizationVariants/variantMaps/100206_ThresholdedVar↙
iantMap_SNRExclude_7.5.dtseries.nii')
brain = map.data(map.brainstructure>0)
brain = map.brainstructure(map.brainstructure>0)
lhem = map.data(brain==1);
unique(lhem)
```

```
unique(map.data)
map = ft_read_cifti_mod↙
('/Users/dianaperez/Box/Research/lateralizationVariants/variantMaps/111514_ThresholdedVar↙
iantMap_SNRExclude_7.5.dtseries.nii')
unique(map.data)
map = ft_read_cifti_mod↙
('/Users/dianaperez/Box/Research/lateralizationVariants/variantMaps/temp/101006_RH_Varian↙
t_Size_50_TempVariantMap_7.5.dtseries.nii')
unique(map.data)
CreateVariantFiles
file = [dataLoc fileName num2str(subject)];
file = [dataLoc num2str(subject) fileName ];
CreateVariantFiles
workbenchdir = '/Users/dianaperez/Applications/workbench/bin_macosx64/';
CreateVariantFiles
map = ft_read_cifti_mod↙
('/Users/dianaperez/Box/Research/lateralizationVariants/variantMaps/100206_ThresholdedVar↙
iantMap_SNRExclude_7.5.dtseries.nii')
unique(map.data)
CreateVariantFiles
map = ft_read_cifti_mod↙
('/Users/dianaperez/Box/Research/lateralizationVariants/variantMaps/100206_ThresholdedVar↙
iantMap_SNRExclude_7.5.dtseries.nii')
unique(map.data)
CreateVariantFiles
unique(cifti.data)
CreateVariantFiles
size(vars_sizes,1)
CreateVariantFiles
map = ft_read_cifti_mod↙
('/Users/dianaperez/Box/Research/lateralizationVariants/variantMaps/100206_ThresholdedVar↙
iantMap_SNRExclude_7.5.dtseries.nii')
unique(map.data)
CreateVariantFiles
clear all
map = ft_read_cifti_mod↙
('/Users/dianaperez/Box/Research/lateralizationVariants/variantMaps/100206_ThresholdedVar↙
iantMap_SNRExclude_7.5.dtseries.nii')
brain = map.brainstructure(map.brainstructure>0);
lhem = map.data(brain==1);
unique(lhem)
rhem = map.data(brain==2);
unique(rhem)
unique(L_hem>0)
unique(lhem>0)
unique(lhem)
unique(lhem)>0
sum(unique(lhem)>0)
L_hem_varIDs = unique(L_hem);
L_hem_varIDs = unique(lhem);
varcount = {LHvars, RHvars, MHvars};
varcount = {}
varcount{1} = {}
varcount{2} = 4
varcount{5} = 4
varcount = {}
varcount{3,1} = 1
varcount{3,2} = 2
varcount{3(1)} = 2
varcount{3[1]} = 2
```

```
varcount{3{1}} = 2
countVarsxHem
file = [dataLoc num2str(subs(x)) fileName];
file = [dataLoc num2str(subs(1)) fileName];
countVarsxHem
subs{1,1}
subs{1,1,1}
countVarsxHem
files(n)
ft_read_cifti_mod(files(n));
countVarsxHem
subsxgroup(1)
subsxgroup{1}
countVarsxHem
groups{g}
countVarsxHem
clear all
load varcount.mat
LH = varcount{1,1};
RH = varcount{1,2};
MH = varcount{1,3};
x = LH(:,2);
y = LH(:,3);
b1 = x/y;
x\y
b1 = x\y;
yCalc1 = b1*x;
scatter(x,y)
hold on
plot(x,yCalc1)
xlabel('Handedness Score')
ylabel('Number of Left Hemisphere Variants')
title('Linear Regression Handedness & Number of Lhem Variants')
X = [ones(length(x),1) x];
b = X\y
yCalc2 = X*b;
plot(x,yCalc2,'--')
legend('Data','Slope','Slope & Intercept','Location','best');
Rsq1 = 1 - sum((y - yCalc1).^2)/sum((y - mean(y)).^2)
Rsq2 = 1 - sum((y - yCalc2).^2)/sum((y - mean(y)).^2)
LH_sorted = sort(LH(:,2),'descend');
[LH_sorted, I] = sort(LH(:,2),'descend');
LH_sorted2 = LH(I)
LH_sorted2 = LH(I,:)
LH = LH_sorted2;
x1 = LH(1:14,2);
x1 = LH(1:24,2);
x2 = LH(25:48,2);
y1 = LH(1:24,3);
y2 = LH(25:48,3);
scatter(x1,y1, 'filled')
clear yCalc1
clear plot
xLH = LH(:,2);
clear all
load('varcount.mat')
LH = varcount{1,1};
RH = varcount{1,2};
MH = varcount{1,3};
xLH = LH(:,2)
```

```
y1LH = LH(:,3);
y2LH = LH(:,4);
scatter(xLH,y1LH)
hold on
scatter(xLH, y2LH)
scatter(xLH, y2LH, 'filled')
X = [ones(length(xLH),1) xLH];
b1 = X\y
b1 = X\y1LH
yCalc1 = X*b1
plot(xLH, yCalc1, '--')
b1 = X\y2LH
yCalc2 = X*b1
plot(xLH, yCalc1)
countVarsxHem
count(Lhem>0)
help count
Lhem(Lhem>0)
Lhem>0
countVarsxHem
clear all
countVarsxHem
clear
load('varcount.mat')
load('vertcount.mat')
LHvars = varcount{1,1};
LHverts = vertcount{1,1};
LH = [LHvars LHverts(:,2:3)];
LH = [LHvars LHverts(:,3:4)];
x=LH(:,2);
y=LH(:,5);
scatter(x,y)
hold on
y2=LH(:,6);
scatter(x,y2,'filled')
X = [ones(length(x),1) x];
b = X\y;
b2 = X\y2;
yCalc = X*b;
yCalc2 = X*b2;
plot(x,yCalc)
hold on
plot(x,yCalc2, '--')
legend('Lhem','Rhem','Lhem slope', 'Rhem slope', 'Location', 'best')
xlabel('Handedness')
ylabel('Number of Variant Vertices')
corr(x,y)
corr(x,y2)
[r p] = corrcoef(x,y2)
[r p] = corrcoef(x,y)
help repmat
x=LH(:,2);
y=LH(:,3);
y2=LH(:,4);
scatter(x,y)
hold on
scatter(x,y2,'filled')
X = [ones(length(x),1) x];
b = X\y;
b2 = X\y2;
```

```
yCalc = X*b;
yCalc2 = X*b2;
plot(x,yCalc)
plot(x,yCalc2, '--')
legend('Lhem','Rhem','Lhem slope', 'Rhem slope', 'Location', 'best')
xlabel('Handedness')
ylabel('Number of Variant Clusters')
[r p] = corrcoef(x,y2)
[r p] = corrcoef(x,y)
RHverts = vertcount{1,2};
RHvars = varcount{1,2};
RH = [RHvars RHverts(:,3:4)];
handedness = RH(:,2);
lhemvars = RH(:,3);
rhemvars = RH(:,4);
lhemverts = RH(:,5);
rhemverts = RH(:,6);
scatter(handedness,lhemvars)
scatter(handedness,rhemvars, 'filled')
hold on
X = [ones(length(handedness),1) handedness];
b = X\lhemvars;
b2 = X\rhemvars;
yCalc = X*b;
yCalc2 = X*b2;
plot(x,yCalc)
plot(x,yCalc2, '--')
legend('Lhem','Rhem','Lhem slope', 'Rhem slope', 'Location', 'best')
xlabel('Handedness')
ylabel('Number of Variant Clusters')
[r_lhem p_lhem] = corrcoef(handedness,lhemvars)
[r_rhem p_rhem] = corrcoef(handedness,rhemvars)
RHverts = vertcount{1,2};
RHvars = varcount{1,2};
RH = [RHvars RHverts(:,3:4)];
clear all
load('varcount.mat')
load('vertcount.mat')
RHverts = vertcount{1,2};
RHvars = varcount{1,2};
RH = [RHvars RHverts(:,3:4)];
clear RHvars
clear RHverts
handedness = RH(:,2);
lhemvars = RH(:,3);
rhemvars = RH(:,4);
lhemverts = RH(:,5);
rhemverts = RH(:,6);
scatter(handedness,lhemvars)
scatter(handedness,rhemvars, 'filled')
scatter(handedness,lhemvars)
hold on
scatter(handedness,rhemvars, 'filled')
X = [ones(length(handedness),1) handedness];
b = X\lhemvars;
b2 = X\rhemvars;
yCalc = X*b;
yCalc2 = X*b2;
plot(x,yCalc)
plot(handedness,yCalc)
```

```
hold on
plot(handedness,yCalc2, '--')
legend('Lhem','Rhem','Lhem slope', 'Rhem slope', 'Location', 'best')
xlabel('Handedness')
ylabel('Number of Variant Clusters')
[r_lhem p_lhem] = corrcoef(handedness,lhemvars)
[r_rhem p_rhem] = corrcoef(handedness,rhemvars)
scatter(handedness,lhemverts)
hold on
scatter(handedness,rhemverts, 'filled')
X = [ones(length(handedness),1) handedness];
b = X\lhemverts;
b2 = X\rhemverts;
yCalc = X*b;
yCalc2 = X*b2;
plot(handedness,yCalc)
hold on
plot(handedness,yCalc2, '--')
legend('Lhem','Rhem','Lhem slope', 'Rhem slope', 'Location', 'best')
xlabel('Handedness')
ylabel('Number of Variant Vertices')
[r_lhem p_lhem] = corrcoef(handedness,lhemverts)
[r_rhem p_rhem] = corrcoef(handedness,rhemverts)
clear all
load('varcount.mat')
load('vertcount.mat')
%% Middle Handers
MHverts = vertcount{1,3};
MHvars = varcount{1,2};
MH = [MHvars MHverts(:,3:4)];
handedness = MH(:,2);
lhemvars = MH(:,3);
rhemvars = MH(:,4);
lhemverts = MH(:,5);
rhemverts = MH(:,6);
scatter(handedness,lhemvars)
hold on
scatter(handedness,rhemvars, 'filled')
X = [ones(length(handedness),1) handedness];
b = X\lhemvars;
b2 = X\rhemvars;
yCalc = X*b;
yCalc2 = X*b2;
plot(handedness,yCalc)
hold on
plot(handedness,yCalc2, '--')
legend('Lhem','Rhem','Lhem slope', 'Rhem slope', 'Location', 'best')
xlabel('Handedness')
ylabel('Number of Variant Clusters')
[r_lhem p_lhem] = corrcoef(handedness,lhemvars)
[r_rhem p_rhem] = corrcoef(handedness,rhemvars)
MHverts = vertcount{1,3};
MHvars = varcount{1,2};
MH = [MHvars MHverts(:,3:4)];
MHverts = vertcount{1,3};
MHvars = varcount{1,3};
MH = [MHvars MHverts(:,3:4)];
handedness = MH(:,2);
lhemvars = MH(:,3);
rhemvars = MH(:,4);
```

```
lhemverts = MH(:,5);
rhemverts = MH(:,6);
scatter(handedness,lhemvars)
hold on
scatter(handedness,rhemvars, 'filled')
X = [ones(length(handedness),1) handedness];
b = X\lhemvars;
b2 = X\rhemvars;
yCalc = X*b;
yCalc2 = X*b2;
plot(handedness,yCalc)
hold on
plot(handedness,yCalc2, '--')
legend('Lhem','Rhem','Lhem slope', 'Rhem slope', 'Location', 'best')
xlabel('Handedness')
ylabel('Number of Variant Clusters')
[r_lhem p_lhem] = corrcoef(handedness,lhemvars)
[r_rhem p_rhem] = corrcoef(handedness,rhemvars)
scatter(handedness,lhemverts)
hold on
scatter(handedness,rhemverts, 'filled')
X = [ones(length(handedness),1) handedness];
b = X\lhemverts;
b2 = X\rhemverts;
yCalc = X*b;
yCalc2 = X*b2;
plot(handedness,yCalc)
hold on
plot(handedness,yCalc2, '--')
legend('Lhem','Rhem','Lhem slope', 'Rhem slope', 'Location', 'best')
xlabel('Handedness')
ylabel('Number of Variant Vertices')
[r_lhem p_lhem] = corrcoef(handedness,lhemverts)
[r_rhem p_rhem] = corrcoef(handedness,rhemverts)
LHvars = varcount{1,1};
RHvars = varcount{1,2};
ALL_vars = [LHvars;RHvars;MHvars];
clear LHvars
clear RHvars
clear b
clear b2
clear handedness
clears lhemvars
clear lhemvars
clear lhemverts
clear MH
clear MHvars
clear MHverts
clear p_lhem
clear p_rhem
clear X
clear yCalc
clear yCalc2
clear r_lhem
clear r_rhem
clear rhemcars
clear rhemverts
clear rhemvars
LH = vertcount{1,1};
RH = vertcount{1,2};
```

```
MH = vertcount{1,3};
ALL_verts = [LH;RH;MH];
clear LH
clear RH
clear MH
ALL = [ALL_vars ALL_verts(:,3:4)];
clear ALL_vars
clear ALL_verts
handedness = ALL(:,2);
hand = handedness;
clear handedness
lhemvars = ALL(:,3);
rhemvars = ALL(:,4);
scatter(hand,lhemvars)
hold on
scatter(hand,rhemvars,'filled')
X = [ones(length(hand),1) hand];
b = X\lhemvars;
b2 = X\rhemvars;
yCalc = X*b;
yCalc2 = X*b2;
plot(hand,yCalc)
hold on
plot(hand,yCalc2, '--')
legend('Lhem','Rhem','Lhem slope', 'Rhem slope', 'Location', 'best')
xlabel('Handedness')
ylabel('Number of Variant Clusters')
[r_lhem p_lhem] = corrcoef(hand,lhemvars)
[r_rhem p_rhem] = corrcoef(hand,rhemvars)
handedness = hand;
clear hand
scatter(handedness,lhemverts)
hold on
lhemverts = ALL(:,5);
rhemverts = ALL(:,6);
scatter(handedness,lhemverts)
X = [ones(length(handedness),1) handedness];
b = X\lhemverts;
yCalc = X*b;
plot(handedness,yCalc)
scatter(handedness,lhemverts)
hold on
X = [ones(length(handedness),1) handedness];
b = X\lhemverts;
yCalc = X*b;
plot(handedness,yCalc)
hold on
[r_lhem p_lhem] = corrcoef(handedness,lhemverts)
scatter(handedness,rhemverts, 'filled')
b2 = X\rhemverts;
yCalc2 = X*b2;
hold on
plot(handedness,yCalc2, '--')
[r_rhem p_rhem] = corrcoef(handedness,rhemverts)
legend('Lhem','Rhem','Lhem slope', 'Rhem slope', 'Location', 'best')
xlabel('Handedness')
ylabel('Number of Variant Vertices')
legend('Lhem','Lhem slope','Rhem', 'Rhem slope', 'Location', 'best')
%-- 11/22/20, 2:01 PM --%
usrpath
```

```
userpath
%-- 11/23/20, 12:26 PM --%
reliability
addpath(genpath('/Users/dianaperez/Box/Quest_Backup/Scripts'))
reliability
%-- 11/29/20, 6:19 PM --%
help pause
%-- 11/30/20, 12:06 AM --%
checkisfloat
%-- 11/30/20, 7:28 PM --%
overlapmap
%-- 12/8/20, 8:23 PM --%
uiopen('/Users/dianaperez/Desktop/100206_Testing_surface_to_metric_leftCTX.func.gii',1)
load('/Users/dianaperez/Desktop/100206_Testing_surface_to_metric_leftCTX.func.gii')
%-- 12/9/20, 8:12 PM --%
help niftiread
%-- 1/4/21, 10:37 PM --%
flip_cifti_ind
%-- 1/5/21, 12:01 PM --%
flip_cifti_ind
hems = cifti.brainstructure(cifti.brainstructure>0);
L_hem = data(hems==1);
L_hem = cifti.date(hems==1);
L_hem = cifti.data(hems==1);
R_hem = cifti.data(hems==2);
for l = 1:length(L_hem)
L_hem(l) == l;
end
for l = 1:length(L_hem)
L_hem(1,l) == l;
end
for l = 1:length(L_hem)
L_hem(l,1) == l;
end
L_hem(1,1) == 1
L_hem(1,1) = 1
for l = 1:length(L_hem)
L_hem(l,1) = l;
end
find(hems==1)
L_hem_ind = find(hem==1);
L_hem_ind = find(hems==1);
R_hem_ind = find(hems==2);
for l = 1:length(L_hem_ind)
cifti.data(l) = l;
end
for r = 1:length(R_hem_ind)
cifti.data(r) = r;
end
for r = 1:length(R_hem_ind)
cifti.data(r) = r;
end
for r = 1:length(R_hem_ind)
cifti.data(r) = R_hem_ind(r);
end
for r = 1:length(R_hem_ind); cifti.data(R_hem_ind(r)) = R_hem_ind(r); end
for l = 1:length(L_hem_ind)
cifti.data(L_hem_ind(l)) = L_hem_ind(l); end
for r = 1:length(R_hem_ind); cifti.data(R_hem_ind(r)) = r; end
ft_write_cifti_mod('/Users/dianaperez/Desktop/testing_symmetry.dtseries.nii', cifti)
```

```
test_cifti = cifti;
test_point = 21200;
test_cifti.data = zeros(length(test_cifti.data));
test_cifti.data = zeros(size(test_cifti.data));
test_cifti.data(test_point) = 1;
test_cifti.data(R_hem_ind(test_point)) = 1;
R_hem_ind(test_point)
ft_write_cifti_mod('/Users/dianaperez/Desktop/testing_symm_of_point.dtseries.nii',↙
test_cifti)
test_cifti.data = zeros(size(test_cifti.data));
test_point = 1558;
test_cifti.data(test_point) = 1;
test_cifti.data(R_hem_ind(test_point)) = 1;
ft_write_cifti_mod('/Users/dianaperez/Desktop/testing_symm_of_point_2.dtseries.nii',↙
test_cifti)
test_point = 15578;
test_cifti.data(test_point) = 1;
test_cifti.data(R_hem_ind(test_point)) = 1;
ft_write_cifti_mod('/Users/dianaperez/Desktop/testing_symm_of_point_2.dtseries.nii',↙
test_cifti)
R_hem_ind(test_point)
%-- 1/6/21, 4:00 PM --%
ft_write_cifti_mod('/Users/dianaperez/Desktop/testing_symmetry.dtseries.nii', cifti)
flip_cifti_ind
test_cifti = cifti;
test_point = 15578;
test_cifti.data = zeros(size(test_cifti.data));
test_cifti.data(test_point) = 1;
hems = cifti.brainstructure(cifti.brainstructure>0);
L_hem_ind = find(hem==1);
L_hem_ind = find(hems==1);
R_hem_ind = find(hems==2);
test_cifti.data(R_hem_ind(test_point)) = 1;
test_cifti.data(44942) = 2;
ft_write_cifti_mod('/Users/dianaperez/Desktop/testing_symmetry_new_script.dtseries.nii',↙
test_cifti)
test_cifti.data(test_point) = 1;
ft_write_cifti_mod('/Users/dianaperez/Desktop/testing_symmetry_new_script.dtseries.nii',↙
test_cifti)
%-- 1/10/21, 3:18 PM --%
filename =↙
'/Users/dianaperez/Box/Research/lateralizationVariants/variantMaps/100206_ThresholdedVari↙
antMap_SNRExclude_7.5.dtseries.nii';
cifti = ft_read_cifti_mod(filename)
data = zeros(1:length(cifti.data);
data = zeros(1:length(cifti.data));
data = zeros(size(cifti.data));
data(43342) =1 ;
data(13869) =1 ;
cifti.data = data;
ft_write_cifti_mod('/Users/dianaperez/Desktop/100206_flipped_variant_map.dtseries.nii',↙
flip_cifti)
ft_write_cifti_mod('/Users/dianaperez/Desktop/test_homotopic pair.dtseries.nii', cifti)
x1 = 52.08;
x2 = -11.79;
z1 = 23.13;
x2 = 50.17;
y2 = 8.72;
z2 = -1.73;
distance = sqrt(((x2-x1)^2)+((y2-y1)^2)+((z2-z1)^2))
```

```
y1 = -11.79
distance = sqrt(((x2-x1)^2)+((y2-y1)^2)+((z2-z1)^2))
x2 = 51.48;
y2 = -10.39
z2 = 23.76
distance = sqrt(((x2-x1)^2)+((y2-y1)^2)+((z2-z1)^2))
x2 = 59.26
y2 = -10.39
z2 = 23.76
distance = sqrt(((x2-x1)^2)+((y2-y1)^2)+((z2-z1)^2))
%-- 1/12/21, 12:41 PM --%
homotopic_overlap
addpath(genpath('/Users/dianaperez/Documents/GitHub/Lateralization_Variants'))
homotopic_overlap
brain = cifti.brainstructure(cifti.brainstructure>0);
hems = brain; clear brain
left_hem = cifti.data(hems==1);
right_hem = cifti.data(hems==2);
left_right_hems = [left_hem right_hem];
left_right_hems = [left_hem right_hem(1:length(left_hem)];
left_right_hems = [left_hem right_hem(1:length(left_hem))];
for i = 1:length(left_right_hems)
if left_right_hems(1) == 1 && left_right_hems(2) == 1
end
if left_right_hems(i,1) == 1 && left_right_hems(i,2) == 1
left_right_hems(i,3) == 1;
else
left_right_hems(i,3) == 0;
end
end
ht_variants = [];
for i = 1:length(left_right_hems)
if left_right_hems(i,1) == 1 && left_right_hems(i,2) == 1
ht_variants = [];
else
end
end
for i = 1:length(left_right_hems)
if left_right_hems(i,1) == 1 && left_right_hems(i,2) == 1
ht_variants = 1;
else
ht_variants = 0;
end
end
for i = 1:length(left_right_hems)
if left_right_hems(i,1) == 1 && left_right_hems(i,2) == 1
ht_variants(i) = 1;
else
ht_variants(i) = 0;
end
end
ht_variants = ht_variants';
sum(ht_variants)
homotopic_overlap
L = template.brainstructure(1:32492);
R = template.brainstructure(32493:end);
unique(L)
unique(R)
for v = 1:64984
if cifti.brainstructure(v) == -1
```

```
ht_variants = 0;
ht_variants(v) = 0;
end
end
for v = 1:64984
if cifti.brainstructure(v) == -1
ht_variants(v) = 0;
elseif cifti.brainstructure(v) == 1
ht_variants(v) =
end
end
end
homotopic_overlap
ht_variants = ht_variants';
unique(ht_variants)
left_hem = ht_variants(1:32492);
right_hem = ht_variants(32492:end);
homotopic_overlap
unique(left_hem)
unique(right_hem)
sum(ht_variants)
sum(allsubs)
homotopic_overlap
groupmap2 = groupmap;
groupmap = [groupmap; groupmap2];
homotopic_overlap
for v = 1:64984
end
ind = [];
for i = 1:32492
ind(i,1) = i
end
for i = 1:32492
ind(i,1) = i;
end
ind = [ind;ind];
ind(35000)
template2 = template;
template2.data = ind;
ft_write_cifti_mod('/Users/dianaperez/Desktop/vertex_equals_index_inc_noncortical.↙
dtseries.nii', template2)
cif = ind(template.brainstructure>0);
template2.data = cif;
ft_write_cifti_mod('/Users/dianaperez/Desktop/vertex_equals_index_inc_noncortical.↙
dtseries.nii', template2)
load('brain_ind.mat')
brain_ind(15578)
find(cif==17288)
cif2 = zeros(size(cif));
cif2(15578) = 1;
cif2(45292) = 1;
template2.data = cif2;
ft_write_cifti_mod('/Users/dianaperez/Desktop/testing_symmetry_points_11578_45292.↙
dtseries.nii', template2)
ft_write_cifti_mod('testing_symmetry_new_script.dtseries.nii')
ft_read_cifti_mod('testing_symmetry_new_script.dtseries.nii')
cifti = ans;
find(cifti.data==1)
find(cif2.data==1)
find(cif2==1)
```

```
cif2(45274) =1;
cif2(54306) = 3;
cif2(45274) =2;
cif2(45274) = 3;
cif2(15578) = 1;
cif2(45292) = 2;
cif2(54306) = 4;
find(cif2>0)
template2.data = cif2;
ft_write_cifti_mod('/Users/dianaperez/Desktop/testing_symmetry_three_methods.dtseries.↙
nii', template2)
find(brain_ind==26389)
find(brain_ind==49731)
cif2(54306) = 0;
cif2(45243) = 4;
ft_write_cifti_mod('/Users/dianaperez/Desktop/testing_symmetry_three_methods.dtseries.↙
nii', template2)
template2.data = cif2;
ft_write_cifti_mod('/Users/dianaperez/Desktop/testing_symmetry_three_methods.dtseries.↙
nii', template2)
cif2(45292) = 0;
cif2(45274) = 0;
cif2(45243) = 1;
template2.data = cif2;
find(cif2>0)
ft_write_cifti_mod('/Users/dianaperez/Desktop/testing_symmetry_15578_45243.dtseries.nii',↙
template2)
ind = [];
for i = 1:32492
ind(i,1) = i;
end
cif = [ind;ind];
cif = cif(template.brainstructure>0);
homotopic_test_points
clear all
homotopic_test_points
brain_indices = brain_indices';
cifti_indices(21200)
64984/2
23001 + 32492
Left_hem = brain_indices(1:32492);
Right_hem = brain_indices(32493:end);
Right_hem(23001)
find(cifti_indices==55493)
homotopic_test_points
unique(cifti2.data)
cifti2.data(LeftCortex) = 1;
cifti2.data(RightCortex) = 1;
homotopic_test_points
left_ctx = cifti.brainstructure(1:32492);
right_ctx = cifti.brainstructure(32493:end);
for i = 1:length(left_ctx)
if left_ctx(i) > 0
left_ctx(i) = Left_hem(i);
end
end
left_cortex = left_ctx>0;
left_cortex = left_ctx(left_ctx>0);
for i = 1:length(right_ctx)
if right_ctx(i) > 0
```

```
right_ctx(i) = Right_hem(i);
end
end
right_cortex = right_ctx(right_ctx>0);
clear ans
clear count
clear i
clear LeftCortex
clear new_cifti
clear pair
clear RightCortex
clear subject
clear target_point
clear test_point
clear threshold
find(left_cortex==15578)
find(right_cortex==15578)
right_ctx(15578)
Right_hem(15578)
cifti.brainstructure(15578+32492)
right_ctx(15578)
find(right_cortex==right_ctx(15578))
LeftCortex = 13868;
right_cortex(13886)
RightCortex = 48070;
cifti2.data = zeros(size(cifti2.data));
cifti2.data(LeftCortex) = 1;
cifti2.data(RightCortex) = 1;
outfile = [outfile_dir 'testing_homotopic_pairs_' num2str(LeftCortex) '_' num2str↙
(RightCortex) '.dtseries.nii'];
ft_write_cifti_mod(outfile, cifti2);
clear all
homotopic_test_points
clear dataLoc
clear filename
clear subject
clear threshold
clear test_point
x = find(cifti_indices == 69)
ind = cifti.brainstructure;
for i = 1:length(ind)
if ind(i) > 0
ind(i) = find(cifti.brainstructure == i );
end
end
for i = 1:length(ind)
if ind(i) > 0
ind(i) = find(cifti.brainstructure == ind(i));
end
end
ind(i) = find(cifti_indices == ind(i));
for i = 1:length(ind)
if ind(i) > 0
ind(i) = find(cifti_indices == ind(i));
end
end
x = find(cifti_indices == 69)
for i = 1:length(ind)
if ind(i) > 0
ind(i) = find(cifti_indices == i);
```

```
end
end
LH = ind(1:(64984/2));
RH = ind((64984/2)+1:end);
clear ind
ind = [LH RH];
ind(15578)
ind(15578,:)
find(ind == 15578)
ind(17288)
ind(17288,:)
i = find(ind == 15578)
homotopic_test_points
%-- 1/18/21, 3:27 PM --%
help niftiread
cd /Volumes/GRATTONLAB/Lifespan/BIDS/Nifti
niftiinfo('sub-LS02_ses-1_task-rest_run-1_space-MNI152NLin6Asym_res-2_desc-preproc_bold.↙
nii.gz')
%-- 1/19/21, 10:07 AM --%
diff_map_homotopic_variants
new_cifti = new_cifti';
find(right_hem>0)
unique(right_hem)
diff_map_homotopic_variants
homotopic_overlap
outfile = '/Users/dianaperez/Desktop/HCP_allSubs_diffMap_394GoodSubs_FlippedHems_thresh7.↙
5.dtseries.nii'
cifti1 = HCP_allSubs_OverlapMap_384GoodSubs_threshold_7.5.dtseries.nii
cifti1 = 'HCP_allSubs_OverlapMap_384GoodSubs_threshold_7.5.dtseries.nii'
cifti2 = 'HCP_allSubs_FlippedOverlapMap_384GoodSubs_threshold_7.5.dtseries.nii'
makeDiffMap(cifti1, cifti2, outfile)
cifti1 = '/Users/dianaperez/Desktop/HCP_allSubs_OverlapMap_384GoodSubs_threshold_7.5.↙
dtseries.nii'
cifti2 =↙
'/Users/dianaperez/Desktop/HCP_allSubs_FlippedOverlapMap_384GoodSubs_threshold_7.5.↙
dtseries.nii'
makeDiffMap(cifti1, cifti2, outfile)
cifti2 = '/Users/dianaperez/Desktop/HCP_LH_FlippedOverlapMap_384GoodSubs_threshold_7.5.↙
dtseries.nii'
cifti1 = '/Users/dianaperez/Desktop/HCP_LH_OverlapMap_384GoodSubs_threshold_7.5.dtseries.↙
nii'
outfile = '/Users/dianaperez/Desktop/HCP_LH_diffMap_394GoodSubs_FlippedHems_thresh7.5.↙
dtseries.nii'
makeDiffMap(cifti1, cifti2, outfile)
cifti2 = '/Users/dianaperez/Desktop/HCP_MH_FlippedOverlapMap_384GoodSubs_threshold_7.5.↙
dtseries.nii'
cifti1 = '/Users/dianaperez/Desktop/HCP_MH_OverlapMap_384GoodSubs_threshold_7.5.dtseries.↙
nii'
outfile = '/Users/dianaperez/Desktop/HCP_MH_diffMap_394GoodSubs_FlippedHems_thresh7.5.↙
dtseries.nii'
makeDiffMap(cifti1, cifti2, outfile)
cifti2 = '/Users/dianaperez/Desktop/HCP_RH_FlippedOverlapMap_384GoodSubs_threshold_7.5.↙
dtseries.nii'
cifti1 = '/Users/dianaperez/Desktop/HCP_RH_OverlapMap_384GoodSubs_threshold_7.5.dtseries.↙
nii'
outfile = '/Users/dianaperez/Desktop/HCP_RH_diffMap_394GoodSubs_FlippedHems_thresh7.5.↙
dtseries.nii'
makeDiffMap(cifti1, cifti2, outfile)
%-- 1/19/21, 4:16 PM --%
load('indices.mat')
```

```
%-- 1/20/21, 12:24 PM --%
permute_diffMaps_flippedVars
clear all
flip_switch = zeros(384,1);
flip_switch(1:length(flip_switch)/2) = 1;
permute_diffMaps_flippedVars
help randperm
ind = randperm(size(flip_switch));
ind = randperm(length(flip_switch));
ind = randperm(length(flip_switch),1);
rand_flip_switch = flip_switch(ind');
help rand
permute_diffMaps_flippedVars
disp(['Permutation #' num2str(p) ': The maximum number of subjects that overlap in the↙
flipped left hemisphere is ' num2str(max(flip_left_sum))])
permute_diffMaps_flippedVars
permute_diffMaps
rand_files(s,1) = allSubs_files{ind(s)};
allSubs_files(294)
rand_files={}
rand_files{s} = allSubs_files(ind(s));
rand_files{2} = allSubs_files(ind(49));
rand_files{2,1} = allSubs_files(ind(49));
clear all
permute_diffMaps
cifti = ft_read_cifti_mod(files(x));
files(x)
files{x}
cifti = ft_read_cifti_mod(files(x);
cifti = ft_read_cifti_mod(files{x});
permute_diffMaps
pseudo_RH_files = rand_files(end-length(RH_files):end);
pseudo_RH_files = rand_files(end-length(RH_files)+1:end);
pseudo_RH_files = rand_files{end-length(RH_files)+1:end};
pseudo_RH_files = rand_files(end-length(RH_files)+1:end);
permute_diffMaps
allSubs_files{2}
allSubs_files(2)
allSubs_files{ind(33)}
permute_diffMaps
files(1)
files{1}
ifti = ft_read_cifti_mod(files{x});
permute_diffMaps
%-- 1/23/21, 11:06 AM --%
overlapmap
outfile = ['/Users/dianaperez/Desktop/HCP_' groups{g}↙
'_OverlapMap_752GoodSubs_matchedGroups_threshold_' num2str(threshold(t)) '.dtseries.↙
nii'];
overlapmap
outfile = ['/Users/dianaperez/Desktop/HCP_brainMask.dtseries.nii'];
[overlap_map] = makemap('allSubs', allSubs_files, template);
mask = [];
for v = 1:length(overlap_map)
end
for v = 1:length(overlap_map.data)
if overlap_map.data > 0
end
if overlap_map.data(v) > 0
brain_mask(v) = 1;
```

```
else
brain_mask(v) = 0;
end
end
sum(overlap_map.data>0)
sum(brain_mask)
brainmask = brainmask';
brainmask = brain_mask';
ft_write_cifti_mod(outfile, brainmask);
template.data = brainmask;
ft_write_cifti_mod(outfile, template);
sum(template.brainstructure==1)
permute_diffMaps_flippedVars
left_masked = left(mask==1,:)
flip_left_masked = flip_left(mask==1,:);
left_sum = sum(left_masked,2);
disp(['Permutation #' num2str(p) ': The maximum number of subjects that overlap in the↙
left hemisphere is ' num2str(max(left_sum))])
flip_left_sum = sum(flip_left_masked,2);
disp(['Permutation #' num2str(p) ': The maximum number of subjects that overlap in the↙
flipped left hemisphere is ' num2str(max(flip_left_sum))])
overlap_left = sum(left,2)/length(files);
disp(['Permutation #' num2str(p) ': The maximum proportion of subjects that overlap in↙
the left hemisphere is ' num2str(max(overlap_left))])
overlap_flip_left = sum(flip_left,2)/length(files);
disp(['Permutation #' num2str(p) ': The maximum proportion of subjects that overlap in↙
the flipped left hemisphere is ' num2str(max(overlap_flip_left))])
spCorrs(p,t) = corr(overlap_left, overlap_flip_left);
permute_diffMaps_flippedVars
make_SNR_mask
read_4dfpimg_HCP_good
make_SNR_mask
etype = 'bigendian';
MeanSNR = mean(inputdata,2);
make_SNR_mask
find(MeanSNR==Nan)
find(MeanSNR==nan)
find(MeanSNR==NaN)
overlapmap
%-- 1/24/21, 9:35 PM --%
permute_diffMaps_flippedVars
clear all
load↙
('/Users/dianaperez/Box/Research/Lateralization_Variants/Permutation_Tests/VariantsvsFlip↙
pedVariants_spCorr_300permutations_5.mat')
dist = spCorrs;
load↙
('/Users/dianaperez/Box/Research/Lateralization_Variants/Permutation_Tests/VariantsvsFlip↙
pedVariants_spCorr_300permutations_4.mat')
dist = [dist; spCorrs];
load↙
('/Users/dianaperez/Box/Research/Lateralization_Variants/Permutation_Tests/VariantsvsFlip↙
pedVariants_spCorr_100-200permutations_2.mat')
dist = [dist; spCorrs];
load↙
('/Users/dianaperez/Box/Research/Lateralization_Variants/Permutation_Tests/VariantsvsFlip↙
pedVariants_spCorr_1-100permutations.mat')
dist = [dist; spCorrs];
min(dist)
max(dist)
```

```
%-- 1/27/21, 10:00 AM --%
permute_diffMaps_flippedVars
clear all
load↙
('/Users/dianaperez/Box/Research/Lateralization_Variants/Permutation_Tests/VariantsvsFlip↙
pedVariants_spCorr_300permutations_5.mat')
dist = spCorrs;
load↙
('/Users/dianaperez/Box/Research/Lateralization_Variants/Permutation_Tests/VariantsvsFlip↙
pedVariants_spCorr_300permutations_4.mat')
dist = [dist; spCorrs];
load↙
('/Users/dianaperez/Box/Research/Lateralization_Variants/Permutation_Tests/VariantsvsFlip↙
pedVariants_spCorr_200permutations_3.mat')
dist = [dist; spCorrs];
load↙
('/Users/dianaperez/Box/Research/Lateralization_Variants/Permutation_Tests/VariantsvsFlip↙
pedVariants_spCorr_1-100permutations.mat')
dist = [dist; spCorrs];
load↙
('/Users/dianaperez/Box/Research/Lateralization_Variants/Permutation_Tests/VariantsvsFlip↙
pedVariants_spCorr_100-200permutations_2.mat')
dist = [dist; spCorrs];
min(dist)
max(dist)
plot(dist)
help plot
plot(dist, 1:1000)
plot(dist, 'circle')
plot(dist, 'o')
pseudo_maps = dist;
clear dist
load↙
('/Users/dianaperez/Box/Research/Lateralization_Variants/Permutation_Tests/VariantsvsFlip↙
pedVariants_spCorr_1permutations.mat')
true_map = spCorrs;
clear spCorrs
hold on
plot(true_map, 'o')
hold on
plot(pseudo_maps, 'o')
hold on
plot(true_map, 500, 'o')
plot(500, true_map, 'o')
plot(pseudo_maps, 'o')
hold on
plot(500, true_map, 'o')
p = plot(500, true_map, 'o', pseudo_maps, 'o')
p = plot(500, true_map, 'o', 1:1000, pseudo_maps, 'o')
clear p
p = plot(500, true_map, 'o', 1:1000, pseudo_maps, 'o')
p = plot(500, true_map, 'o', 'filled', 1:1000, pseudo_maps, 'o', 'filled')
p = plot(500, true_map, 'ro', 1:1000, pseudo_maps, 'ro')
p = plot(500, true_map, 'ro', 'MarkerFaceColor', 'r', 1:1000, pseudo_maps, 'bo',↙
'MarkerFaceColor', 'b')
help plot
plot(500, true_map, 'ro', 'MarkerFaceColor', 'r')
hold on
plot(1:1000, pseudo_maps, 'bo', 'MarkerFaceColor', 'b')
plot(1:1000, pseudo_maps, 'bo')
```

```
hold on
plot(500, true_map, 'ro', 'MarkerFaceColor', 'r')
%-- 1/27/21, 1:16 PM --%
overlapmap
g = {'allSubs'};
datafiles = {allSubs_files};
outfile =↙
'/Users/dianaperez/Box/Research/Lateralization_Variants/OverlapMaps/OverlapMaps-↙
Jan19_2021/HCP_allSubs_diffMap_394GoodSubs_FlippedHems_thresh7.5.dtseries.nii';
overlapmap
for y = 1:nfiles
cifti = ft_read_cifti_mod(files{x});
new_cifti = [];
count = 1;
for i = 1:length(cifti.brainstructure)
if cifti.brainstructure(i) > 0
if cifti.data(count) >0
new_cifti(i,1) = 1;
else new_cifti(i,1) = 0;
end
count = count + 1;
else
new_cifti(i,1) = cifti.brainstructure(i);
end
end
left_hem = new_cifti(1:(length(new_cifti)/2));
right_hem = new_cifti((length(new_cifti)/2)+1:end);
flipped_hems = [right_hem; left_hem];
flipped_cifti = flipped_hems(cifti.brainstructure>0);
for q = 1:length(flipped_cifti)
if flipped_cifti(q) > 0
allSubs(q,y) = 1;
elseif flipped_cifti(q) == 0
allSubs(q,y) = 0;
end
end
end
flipped_groupsum = sum(allsubs,2);
disp(['The maximum number of subjects that overlap in the ' group ' group is ' num2str↙
(max(groupsum))])
flipped_groupmap = sum(allsubs,2)/nfiles;
disp(['The maximum proportion of subjects that overlap in the ' group ' group is '↙
num2str(max(groupmap))])
diff = groupmap - flipped_groupmap;
template.data = diff
outfile =↙
'/Users/dianaperez/Box/Research/Lateralization_Variants/OverlapMaps/OverlapMaps-↙
Jan19_2021/HCP_allSubs_diffMap_394GoodSubs_FlippedHems_thresh7.5.dtseries.nii';
ft_write_cifti_mod(outfile, template)
dir = '/Users/dianaperez/Box/Research/Lateralization_Variants/OverlapMaps/OverlapMaps-↙
Jan19_2021/';
makeDiffMap([dir 'HCP_allSubs_OverlapMap_384GoodSubs_threshold_7.5.dtseries.nii'], [dir↙
'HCP_allSubs_FlippedOverlapMap_384GoodSubs_threshold_7.5.dtseries.nii'], [[dir↙
'HCP_allSubs_diffMap_384GoodSubs_FlippedHems_thresh7.5.dtseries.nii']);
makeDiffMap([dir 'HCP_allSubs_OverlapMap_384GoodSubs_threshold_7.5.dtseries.nii'], [dir↙
'HCP_allSubs_FlippedOverlapMap_384GoodSubs_threshold_7.5.dtseries.nii'], [[dir↙
'HCP_allSubs_diffMap_384GoodSubs_FlippedHems_thresh7.5.dtseries.nii']]);
permute_diffMaps_flippedVars
permute_left_right_handers
clear all
```

```
load↙
('/Users/dianaperez/Box/Research/Lateralization_Variants/Permutation_Tests/VariantsvsFlip↙
pedVariants_LH_spCorr_1_thresh_7.5_permutations.mat')
true_map = spCorrs;
load↙
('/Users/dianaperez/Box/Research/Lateralization_Variants/Permutation_Tests/VariantsvsFlip↙
pedVariants_LH_spCorr_1000_thresh_7.5_permutations.mat')
pseudo_maps = spCorrs;
plot(1:1000, pseudo_maps, 'bo', 'MarkerFaceColor', 'b')
hold on
plot(500, true_map, 'ro', 'MarkerFaceColor', 'r')
permute_left_right_handers
clear all
load↙
('/Users/dianaperez/Box/Research/Lateralization_Variants/Permutation_Tests/VariantsvsFlip↙
pedVariants_MH_spCorr_1_thresh_7.5_permutations.mat')
true_map = spCorrs;
load↙
('/Users/dianaperez/Box/Research/Lateralization_Variants/Permutation_Tests/VariantsvsFlip↙
pedVariants_MH_spCorr_1000_thresh_7.5_permutations.mat')
pseudo_maps = spCorrs;
plot(1:1000, pseudo_maps, 'bo')
hold on
plot(500, true_map, 'ro', 'MarkerFaceColor', 'r')
ylim([0 1]);
ylim([0.5 1]);
ylabel('r value');
xlabel('Permutations');
m = findobj(gca, 'Type', 'marker');
m = findobj(gca);
m = findobj(gca, 'Type', 'line');
hleg1 = legend(m(1:2), 'randomized maps', 'true map', 'Location', 'SouthWest');
hleg1 = legend(m(1:2), 'true map', 'randomized maps', 'Location', 'SouthWest');
hleg1.FontSize = 14;
ax = gca;
ax.FontSize = 14;
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.5, 0.7, 0.5, 0.7]);
print(gcf,[outputDir 'VariantsvsFlippedVariants_' groups{g} '_spCorr_'  num2str(threshold↙
(t)) '_thresh_' num2str(numperms) '_permutations_results.jpg'],'-dpng','-r300');
rootDir = '/Users/dianaperez/Box/Research/Lateralization_Variants/';
outputDir = [rootDir 'Permutation_Tests/'];
print(gcf,[outputDir 'VariantsvsFlippedVariants_' groups{g} '_spCorr_'  num2str(threshold↙
(t)) '_thresh_' num2str(numperms) '_permutations_results.jpg'],'-dpng','-r300');
print(gcf,[outputDir 'VariantsvsFlippedVariants_MH_spCorr_7.↙
5_thresh_1000_permutations_results.jpg'],'-dpng','-r300');
permute_left_right_handers
figure;
plot(1:numperms, spCorrs, 'bo')
ylim([.4 1]);
hold on
plot(round(numperms/2), true_spCorr, 'ro', 'MarkerFaceColor', 'r')
ylabel('r value');
xlabel('Permutations');
title(['Left Hem vs Pseudo Left Hem Variant Maps - ' groups{g}]);
m = findobj(gca, 'Type', 'line');
hleg1 = legend(m(1:2), 'randomized maps', 'true map', 'Location', 'SouthWest');
hleg1.FontSize = 14;
ax = gca;
ax.FontSize = 14;
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.5, 0.7, 0.5, 0.7]);
```

```
print(gcf,[outputDir 'VariantsvsFlippedVariants_' groups{g} '_spCorr_'  num2str(threshold↙
(t)) '_thresh_' num2str(numperms) '_permutations_results.jpg'],'-dpng','-r300');
close gcf
permute_left_right_handers
load↙
('/Users/dianaperez/Box/Research/Lateralization_Variants/Permutation_Tests/VariantsvsFlip↙
pedVariants_RH_spCorr_1000_thresh_7.5_permutations.mat')
mean(spCorrs)
load↙
('/Users/dianaperez/Box/Research/Lateralization_Variants/Permutation_Tests/VariantsvsFlip↙
pedVariants_LH_spCorr_1000_thresh_7.5_permutations.mat')
mean(spCorrs)
load↙
('/Users/dianaperez/Box/Research/Lateralization_Variants/Permutation_Tests/VariantsvsFlip↙
pedVariants_MH_spCorr_1000_thresh_7.5_permutations.mat')
mean(spCorrs)
load↙
('/Users/dianaperez/Box/Research/Lateralization_Variants/Permutation_Tests/VariantsvsFlip↙
pedVariants_randomizedMaps_spCorr_1000permutations.mat')
mean(spCorrs)
load↙
('/Users/dianaperez/Box/Research/Lateralization_Variants/Permutation_Tests/VariantsvsFlip↙
pedVariants_randomizedMaps_spCorr_1000permutations.mat')
clear all
load↙
('/Users/dianaperez/Box/Research/Lateralization_Variants/Permutation_Tests/VariantsvsFlip↙
pedVariants_randomizedMaps_spCorr_1000permutations.mat')
mean(pseudo_maps)
%-- 1/28/21, 5:10 PM --%
permute_left_right_handers
unique(pseudoLH)
unique(pseudoRH);
permute_left_right_handers
%-- 2/3/21, 10:43 AM --%
permute_flippedVars
help niftiwrite
permutations_cluster_correction
load('/Users/dianaperez/Box/Quest_Backup/Scripts/CIFTI_RELATED/Resources/Conte69_atlas-↙
v2.LR.32k_fs_LR.wb/Cifti_surf_neighbors_LR_normalwall.mat')
permutations_cluster_correction
clear all
permutations_cluster_correction
permute_flippedVars
permutations_cluster_correction
clear all
permutations_cluster_correction
unique(diffmat_bin)
permutations_cluster_correction
unique(diffmat_bin)
load↙
('/Users/dianaperez/Box/Research/Lateralization_Variants/Permutation_Tests/PseudoRightvsP↙
seudoLeftHanders_spCorr_1000_thresh_7.5_permutations_allRH.mat')
load↙
('/Users/dianaperez/Box/Research/Lateralization_Variants/Permutation_Tests/RightvsLeftHan↙
ders_true_spCorr_1000_thresh_7.5.mat')
p = spCorrs<true_spCorr;
count(p)
p = count(spCorrs<true_spCorr);
p = sum(spCorrs<true_spCorr);
p = 23/1000;
```

```
mean(spCorrs)
permute_left_right_handers
load↙
('/Users/dianaperez/Box/Research/Lateralization_Variants/Permutation_Tests/RightvsLeftHan↙
ders_true_spCorr_1000_thresh_7.5.mat')
load↙
('/Users/dianaperez/Box/Research/Lateralization_Variants/Permutation_Tests/PseudoRightvsP↙
seudoLeftHanders_spCorr_1000_thresh_7.5_permutations_allRH.mat')
p = count(spCorrs<true_spCorr);
p = sum(spCorrs<true_spCorr);
clear all
load↙
('/Users/dianaperez/Box/Research/Lateralization_Variants/Permutation_Tests/PseudoRightvsP↙
seudoLeftHanders_spCorr_1000_thresh_7.5_permutations_allRH.mat')
load↙
('/Users/dianaperez/Box/Research/Lateralization_Variants/Permutation_Tests/RightvsLeftHan↙
ders_true_spCorr_1000_thresh_7.5.mat')
permute_left_right_handers
p = sum(spCorrs<true_spCorr);
mean(spCorrs)
load↙
('/Users/dianaperez/Box/Research/Lateralization_Variants/Permutation_Tests/PseudoRightvsP↙
seudoLeftHanders_spCorr_1000_thresh_7.5_permutations_allRH.mat')
mean(spCorrs)
p = sum(spCorrs<true_spCorr);
figure;
plot(1:numperms, spCorrs, 'bo')
ylim([.4 1]);
hold on
plot(round(numperms/2), true_spCorr, 'ro', 'MarkerFaceColor', 'r')
ylabel('r value');
xlabel('Permutations');
title('Left Handers vs Right Handers Variant Maps');
m = findobj(gca, 'Type', 'line');
hleg1 = legend(m(1:2), 'randomized maps', 'true map', 'Location', 'SouthWest');
hleg1.FontSize = 14;
ax = gca;
ax.FontSize = 14;
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.5, 0.7, 0.5, 0.7]);
load↙
('/Users/dianaperez/Box/Research/Lateralization_Variants/Permutation_Tests/PseudoRightvsP↙
seudoLeftHanders_spCorr_1000_thresh_7.5_permutations.mat')
mean(spCorrs)
p = sum(spCorrs<true_spCorr);
390/1000
true_spCorr = .71
p = sum(spCorrs<true_spCorr);
p/1000
true_spCorr = .73
p = sum(spCorrs<true_spCorr);
p/1000
%-- 2/5/21, 9:34 PM --%
permute_flippedVars
mean(diffmats)
mean(diffmats);
mean(ans);
permutations_cluster_correction
mean(diffmats);
mean(ans);
permutations_cluster_correction
```

```
help makenifti
help writenifti
niftiwrite
help niftiwrite
outlier_voxels
filename = [outdir '/sub-' sub '_ses-' num2str(ses(s)) '_run-' num2str(r)↙
'_outlier_voxels.nii.gz'];
niftiwrite(new_nii, filename)
niftiinfo(filename)
info = niftiinfo(filename)
clear all
filename = [outdir '/sub-' sub '_ses-' num2str(ses(s)) '_run-' num2str(r)↙
'_outlier_voxels.nii.gz'];
outdir = '/Users/dianaperez/Desktop/Research/Lifespan/';
filename = [outdir '/sub-' sub '_ses-' num2str(ses(s)) '_run-' num2str(r)↙
'_outlier_voxels.nii.gz'];
sub = 'LS05';
filename = [outdir '/sub-' sub '_ses-1_run-1_outlier_voxels.nii.gz'];
info = niftiinfo(filename)
info = niftiread(filename)
%-- 2/8/21, 11:17 AM --%
addpath(genpath('/Users/dianaperez/Box/Quest_Backup/Scripts/'))
CreateVariantFiles_LS03specific
addpath(genpath('/Users/dianaperez/Box/Dependencies/cifti-matlab-master'))
CreateVariantFiles_LS03specific
[cifti_rest.data] = ExcludeVariantSize(cifti_rest.data, subject, threshold(x), 50);
[cifti_rest.data] = ExcludeVariantbySize(cifti_rest.data, subject, threshold(x), 50);
CreateVariantFiles_LS03specific
subsampling
CreateVariantFiles_LS03specific
map_1 = ft_read_cifti_mod↙
('/Users/dianaperez/Desktop/Research/Lifespan/LS03_variants_sizeExcluded_first-↙
half_thresh-5_smooth_2.55.dtseries.nii');
map_2 = ft_read_cifti_mod↙
('/Users/dianaperez/Desktop/Research/Lifespan/LS03_variants_sizeExcluded_second-↙
half_thresh-5_smooth_2.55.dtseries.nii');
spCorr = corr(map_1, map_2);
spCorr = corr(map_1.data, map_2.data);
map_1 = ft_read_cifti_mod↙
('/Users/dianaperez/Desktop/Research/Lifespan/LS03_variants_sizeExcluded_first-↙
half_thresh-10_smooth_2.55.dtseries.nii');
map_2 = ft_read_cifti_mod↙
('/Users/dianaperez/Desktop/Research/Lifespan/LS03_variants_sizeExcluded_second-↙
half_thresh-10_smooth_2.55.dtseries.nii');
spCorr = corr(map_1.data, map_2.data);
clear all
load↙
('/Users/dianaperez/Box/Research/Lateralization_Variants/Permutation_Tests/PseudoRightvsP↙
seudoLeftHanders_spCorr_1_thresh_7.5_permutations.mat')
load↙
('/Users/dianaperez/Box/Research/Lateralization_Variants/Permutation_Tests/PseudoRightvsP↙
seudoLeftHanders_spCorr_1000_thresh_7.5_permutations_allRH.mat')
mean(spCorrs)
load↙
('/Users/dianaperez/Box/Research/Lateralization_Variants/Permutation_Tests/PseudoRightvsP↙
seudoLeftHanders_spCorr_1_thresh_7.5_permutations.mat')
load↙
('/Users/dianaperez/Box/Research/Lateralization_Variants/Permutation_Tests/RightvsLeftHan↙
ders_true_spCorr_1_thresh_7.5.mat')
load↙
```

```
('/Users/dianaperez/Box/Research/Lateralization_Variants/Permutation_Tests/PseudoRightvsP↙
seudoLeftHanders_spCorr_1000_thresh_7.5_permutations_allRH.mat')
p = sum(spCorrs<true_spCorr)
p = p/length(spCorrs)
permute_left_right_handers
trueCorrs = true_spCorr;
permute_left_right_handers
load↙
('/Users/dianaperez/Box/Research/Lateralization_Variants/Permutation_Tests/PseudoRightvsP↙
seudoLeftHanders_spCorr_1000_thresh_7.5_permutations.mat')
mean(spCorrs)
p = sum(spCorrs<true_spCorr)
p = p/length(spCorrs)
true_spCorr = 0.73
p = sum(spCorrs<true_spCorr)
p = p/length(spCorrs)
true_spCorr = [.73, .75, .76];
figure;
plot(1:numperms, spCorrs, 'bo')
ylim([.4 1]);
hold on
plot(round(numperms/2), true_spCorr, 'ro', 'MarkerFaceColor', 'r')
plot([498, 500, 502], true_spCorr, 'ro', 'MarkerFaceColor', 'r')
figure;
plot(1:numperms, spCorrs, 'bo')
ylim([.4 1]);
hold on
plot([498, 500, 502], true_spCorr, 'ro', 'MarkerFaceColor', 'r')
plot([400, 500, 600], true_spCorr, 'ro', 'MarkerFaceColor', 'r')
figure;
plot(1:numperms, spCorrs, 'bo')
ylim([.4 1]);
hold on
plot([400, 500, 600], true_spCorr, 'ro', 'MarkerFaceColor', 'r')
ylabel('r value');
xlabel('Permutations');
title('Left Handers vs Right Handers Variant Maps');
m = findobj(gca, 'Type', 'line');
hleg1 = legend(m(1:2), 'true maps', 'randomized map', 'Location', 'SouthWest');
hleg1.FontSize = 14;
ax = gca;
ax.FontSize = 14;
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.5, 0.7, 0.5, 0.7]);
print(gcf,[outputDir 'RightvsLeftHanders_spCorr_'  num2str(threshold(t)) '_thresh_'↙
num2str(numperms) '_permutations_results_all_RH.jpg'],'-dpng','-r300');
close gcf
clear all
map_1 = ft_read_cifti_mod↙
('/Users/dianaperez/Desktop/Research/Lifespan/LS03_variants_sizeExcluded_first-↙
half_thresh-10_smooth_2.55.dtseries.nii');
map_2 = ft_read_cifti_mod↙
('/Users/dianaperez/Desktop/Research/Lifespan/LS03_variants_sizeExcluded_second-↙
half_thresh-10_smooth_2.55.dtseries.nii');
diff=map_1.data - map_2.data;
ft_write_cifti_mod('/Users/dianaperez/Desktop/diff_variants_LS03_thresh_10.dtseries.nii',↙
diff)
template = map_1;
template.data = diff;
ft_write_cifti_mod('/Users/dianaperez/Desktop/diff_variants_LS03_thresh_10.dtseries.nii',↙
template)
```

```
map_1 = ft_read_cifti_mod↙
('/Users/dianaperez/Desktop/Research/Lifespan/LS03_variants_sizeExcluded_first-↙
half_thresh-5_smooth_2.55.dtseries.nii');
map_2 = ft_read_cifti_mod↙
('/Users/dianaperez/Desktop/Research/Lifespan/LS03_variants_sizeExcluded_second-↙
half_thresh-5_smooth_2.55.dtseries.nii');
diff=map_1.data - map_2.data;
template.data = diff;
ft_write_cifti_mod('/Users/dianaperez/Desktop/diff_variants_LS03_thresh_5.dtseries.nii',↙
template)
map_1 = ft_read_cifti_mod('/Users/dianaperez/Desktop/sub-LS03_spCorr_first-↙
half_try1__vs_120_allsubs_corr_cortex_corr.dtseries.nii');
map_2 = ft_read_cifti_mod('/Users/dianaperez/Desktop/sub-LS03_spCorr_second-↙
half_try1__vs_120_allsubs_corr_cortex_corr.dtseries.nii');
% correlation between the two
spCorr = corr(map_1.data, map_2.data);
%-- 2/17/21, 2:05 PM --%
corr_to_corr
clear LS02_1 LS02_2 LS02_3
clear LS03_1 LS03_2 LS03_3 LS03_4 LS03_5
clear LS05_1 LS05_2 LS05_3 LS05_4 LS05_5
clear LS07_1 LS07_2
corr_to_corr
for s = 1:4 %different subjects, avg over sessions
figure_corrmat_GrattonLab(squeeze(group_corrmat(s,:,:,:)),atlas_params,-0.4,1);
title(['AllSessAvg, Subject ' subs{s}]);
colormap('jet');
saveas(gcf, [outDir 'Corrmat_' subs{s} '_sessmean.tiff'],'tiff');
end
close('all');
maskmat = ones(atlas_params.num_rois);
maskmat = logical(triu(maskmat,1));
%not averaged across sessions
tmp = corrmat_2(1,:,:,:);
corrlin(1,:) = tmp(maskmat);
tmp = corrmat_2(2,:,:,:);
corrlin(2,:) = tmp(maskmat);
tmp = corrmat_2(3,:,:,:);
corrlin(3,:) = tmp(maskmat);
tmp = corrmat_3(1,:,:,:);
corrlin(4,:) = tmp(maskmat);
tmp = corrmat_3(2,:,:,:);
corrlin(5,:) = tmp(maskmat);
tmp = corrmat_3(3,:,:,:);
corrlin(6,:) = tmp(maskmat);
tmp = corrmat_3(4,:,:,:);
corrlin(7,:) = tmp(maskmat);
tmp = corrmat_3(5,:,:,:);
corrlin(8,:) = tmp(maskmat);
% tmp = mean_LS04;
% corrlin(9,:) = tmp(maskmat);
tmp = corrmat_5(1,:,:,:);
corrlin(9,:) = tmp(maskmat);
tmp = corrmat_5(2,:,:,:);
corrlin(10,:) = tmp(maskmat);
tmp = corrmat_5(3,:,:,:);
corrlin(11,:) = tmp(maskmat);
tmp = corrmat_5(4,:,:,:);
corrlin(12,:) = tmp(maskmat);
tmp = corrmat_5(5,:,:,:);
```

```
corrlin(13,:) = tmp(maskmat);
tmp = corrmat_7(1,:,:,:);
corrlin(14,:) = tmp(maskmat);
tmp = corrmat_7(2,:,:,:);
corrlin(15,:) = tmp(maskmat);
% tmp = mean_LS10;
% corrlin(17,:) = tmp(maskmat);
simmat = corr(corrlin');
figure('Position',[1 1 1000 800]);
imagesc(simmat,[0 1]); colormap('jet');
hline_new([3,8,13,15]+0.5,'k',2);
vline_new([3,8,13,15]+0.5,'k',2);
set(gca,'XTick',[2,6,11,14.5], 'YTick', [2,6,11,14.5], 'XTickLabel',...
{'LS02', 'LS03', 'LS05', 'LS07'}, 'YTickLabel', {'LS02', 'LS03', 'LS05', 'LS07'});
axis square;
colorbar;
title('Correlation Matrix Similarity');
saveas(gcf,[outDir 'SimilarityMat_rest.tiff'],'tiff');
maskmat = ones(atlas_params.num_rois);
maskmat = logical(triu(maskmat,1));
count = 1;
for s = 1:6
tmp = mean_corrmat(s,:,:,:);
corrlin(count,:) = tmp(maskmat);
count = count+1;
end
% end
simmat = corr(corrlin');
figure('Position',[1 1 1000 800]);
imagesc(simmat,[0 1]); colormap('jet');
hline_new([3,8,9,14,16]+0.5,'k',2);
vline_new([3,8,9,14,16]+0.5,'k',2);
set(gca,'XTick',[2,6,9,12,15.5,17], 'YTick', [2,6,9,12,15.5,17], 'XTickLabel',...
{'LS02', 'LS03', 'LS04', 'LS05', 'LS07', 'LS10'}, 'YTickLabel', {'LS02', 'LS03', 'LS04',↙
'LS05', 'LS07', 'LS10'});
axis square;
colorbar;
title('Correlation Matrix Similarity');
saveas(gcf,[outDir 'SimilarityMat_averaged.tiff'],'tiff');
clear corrlin
tmp = corrmat_2(1,:,:,:);
corrlin(1,:) = tmp(maskmat);
tmp = corrmat_2(2,:,:,:);
corrlin(2,:) = tmp(maskmat);
tmp = corrmat_2(3,:,:,:);
corrlin(3,:) = tmp(maskmat);
simmat = corr(corrlin');
figure('Position',[1 1 1000 800]);
imagesc(simmat,[0 1]); colormap('jet');
hline_new([3,8,13,15]+0.5,'k',2);
vline_new([3,8,13,15]+0.5,'k',2);
axis square;
colorbar;
clear corrlin
tmp = corrmat_3(1,:,:,:);
corrlin(1,:) = tmp(maskmat);
tmp = corrmat_3(2,:,:,:);
corrlin(2,:) = tmp(maskmat);
tmp = corrmat_3(3,:,:,:);
corrlin(3,:) = tmp(maskmat);
```

```
tmp = corrmat_3(4,:,:,:);
corrlin(4,:) = tmp(maskmat);
tmp = corrmat_3(5,:,:,:);
corrlin(5,:) = tmp(maskmat);
simmat = corr(corrlin');
figure('Position',[1 1 1000 800]);
imagesc(simmat,[0 1]); colormap('jet');
hline_new([1,2,3,4,5]+0.5,'k',2);
vline_new([1,2,3,4,5]+0.5,'k',2);
set(gca, 'XTick', [1,2,3,4,5], 'YTick', [1:5], 'XTickLabel', {'ses-1', 'ses-2', 'ses-3',↙
'ses-4', 'ses-5'}, 'YTickLabel', {'ses-1', 'ses-2', 'ses-3', 'ses-4', 'ses-5'});
axis square;
colorbar;
title('Similarity Across Sessions for sub-LS03')
saveas(gcf, [outDir 'simmat_sub-LS03.tiff'], 'tiff');
tmp = corrmat_5(1,:,:,:);
corrlin(1,:) = tmp(maskmat);
tmp = corrmat_5(2,:,:,:);
corrlin(2,:) = tmp(maskmat);
tmp = corrmat_5(3,:,:,:);
corrlin(3,:) = tmp(maskmat);
tmp = corrmat_5(4,:,:,:);
corrlin(4,:) = tmp(maskmat);
tmp = corrmat_5(5,:,:,:);
corrlin(5,:) = tmp(maskmat);
simmat = corr(corrlin');
figure('Position',[1 1 1000 800]);
imagesc(simmat,[0 1]); colormap('jet');
hline_new([1,2,3,4,5]+0.5,'k',2);
vline_new([1,2,3,4,5]+0.5,'k',2);
set(gca, 'XTick', [1,2,3,4,5], 'YTick', [1:5], 'XTickLabel', {'ses-1', 'ses-2', 'ses-3',↙
'ses-4', 'ses-5'}, 'YTickLabel', {'ses-1', 'ses-2', 'ses-3', 'ses-4', 'ses-5'});
axis square;
colorbar;
title('Similarity Across Sessions for sub-LS05')
saveas(gcf, [outDir 'simmat_sub-LS05.tiff'], 'tiff');
mean_corr = mean(triu(simmat))
maskmat = logical(triu(simmat,1));
mean_corr = mean(simmat(maskmat))
tmp = corrmat_3(1,:,:,:);
corrlin(1,:) = tmp(maskmat);
tmp = corrmat_3(2,:,:,:);
corrlin(2,:) = tmp(maskmat);
tmp = corrmat_3(3,:,:,:);
corrlin(3,:) = tmp(maskmat);
tmp = corrmat_3(4,:,:,:);
corrlin(4,:) = tmp(maskmat);
tmp = corrmat_3(5,:,:,:);
corrlin(5,:) = tmp(maskmat);
simmat = corr(corrlin');
maskmat = ones(atlas_params.num_rois);
maskmat = logical(triu(maskmat,1));
tmp = corrmat_3(1,:,:,:);
corrlin(1,:) = tmp(maskmat);
tmp = corrmat_3(2,:,:,:);
corrlin(2,:) = tmp(maskmat);
tmp = corrmat_3(3,:,:,:);
corrlin(3,:) = tmp(maskmat);
tmp = corrmat_3(4,:,:,:);
corrlin(4,:) = tmp(maskmat);
```

```
tmp = corrmat_3(5,:,:,:);
corrlin(5,:) = tmp(maskmat);
simmat = corr(corrlin');
maskmat2 = logical(triu(simmat,1));
mean_corr = mean(simmat(maskmat2))
clear corrlin
tmp = corrmat_2(1,:,:,:);
corrlin(1,:) = tmp(maskmat);
tmp = corrmat_2(2,:,:,:);
corrlin(2,:) = tmp(maskmat);
tmp = corrmat_2(3,:,:,:);
corrlin(3,:) = tmp(maskmat);
simmat = corr(corrlin');
maskmat2 = logical(triu(simmat,1));
mean_corr = mean(simmat(maskmat2))
tmp = corrmat_7(1,:,:,:);
clear corrlin
tmp = corrmat_7(1,:,:,:);
corrlin(1,:) = tmp(maskmat);
tmp = corrmat_2(2,:,:,:);
corrlin(2,:) = tmp(maskmat);
simmat = corr(corrlin');
maskmat2 = logical(triu(simmat,1));
mean_corr = mean(simmat(maskmat2))
tmp = corrmat_7(2,:,:,:);
corrlin(2,:) = tmp(maskmat);
simmat = corr(corrlin');
mean_corr = mean(simmat(maskmat2))
tmp = corrmat_2(1,:,:,:);
corrlin(1,:) = tmp(maskmat);
tmp = corrmat_2(2,:,:,:);
corrlin(2,:) = tmp(maskmat);
tmp = corrmat_2(3,:,:,:);
corrlin(3,:) = tmp(maskmat);
tmp = corrmat_3(1,:,:,:);
corrlin(4,:) = tmp(maskmat);
tmp = corrmat_3(2,:,:,:);
corrlin(5,:) = tmp(maskmat);
tmp = corrmat_3(3,:,:,:);
corrlin(6,:) = tmp(maskmat);
tmp = corrmat_3(4,:,:,:);
corrlin(7,:) = tmp(maskmat);
tmp = corrmat_3(5,:,:,:);
corrlin(8,:) = tmp(maskmat);
% tmp = mean_LS04;
% corrlin(9,:) = tmp(maskmat);
tmp = corrmat_5(1,:,:,:);
corrlin(9,:) = tmp(maskmat);
tmp = corrmat_5(2,:,:,:);
corrlin(10,:) = tmp(maskmat);
tmp = corrmat_5(3,:,:,:);
corrlin(11,:) = tmp(maskmat);
tmp = corrmat_5(4,:,:,:);
corrlin(12,:) = tmp(maskmat);
tmp = corrmat_5(5,:,:,:);
corrlin(13,:) = tmp(maskmat);
tmp = corrmat_7(1,:,:,:);
corrlin(14,:) = tmp(maskmat);
tmp = corrmat_7(2,:,:,:);
corrlin(15,:) = tmp(maskmat);
```

```
simmat = corr(corrlin');
figure('Position',[1 1 1000 800]);
imagesc(simmat,[0 1]); colormap('jet');
help squeeze
clear corrlin
corrlin(1,:) = mean_LS02(maskmat);
corrlin(2,:) = mean_LS03(maskmat);
corrlin(3,:) = mean_LS05(maskmat);
corrlin(4,:) = mean_LS07(maskmat);
simmat = corr(corrlin');
figure('Position',[1 1 1000 800]);
imagesc(simmat,[0 1]); colormap('jet');
maskmat2 = logical(triu(simmat,1));
mean_corr = mean(simmat(maskmat2))
hline_new([0, 1,2,3,4]+0.5,'k',2);
vline_new([0, 1,2,3,4]+0.5,'k',2);
set(gca,'XTick',[1,2,3,4], 'YTick', [1,2,3,4], 'XTickLabel', {'LS02', 'LS03', 'LS05',↙
'LS07'}, 'YTickLabel', {'LS02', 'LS03', 'LS05', 'LS07'};
set(gca,'XTick',[1,2,3,4], 'YTick', [1,2,3,4], 'XTickLabel', {'LS02', 'LS03', 'LS05',↙
'LS07'}, 'YTickLabel', {'LS02', 'LS03', 'LS05', 'LS07'});
a = get(gca, 'XTickLabel');
set(gca,'XTickLabel',a,'fontsize',15,'FontWeight','bold')
set(gca,'XTickLabel',a,'fontsize',20,'FontWeight','bold')
axis square;
colorbar;
title('Correlation Matrix Similarity');
title('fontsize', 30)
title('Correlation Matrix Similarity');
saveas(gcf,[outDir 'SimilarityMat_averaged.tiff'],'tiff');
corr_to_corr
title('Similarity Across Subjects (r)');
clear corrlin
for s = 1:numSubs
corrlin(s,:) = group_corrmat(s,maskmat);
end
clear corrlin
if multi_ses_only
corrlin(1,:) = mean_LS02(maskmat);
corrlin(2,:) = mean_LS03(maskmat);
corrlin(3,:) = mean_LS05(maskmat);
corrlin(4,:) = mean_LS07(maskmat);
else
corrlin(1,:) = mean_LS02(maskmat);
corrlin(2,:) = mean_LS03(maskmat);
corrlin(3,:) = mean_LS04(maskmat);
corrlin(4,:) = mean_LS05(maskmat);
corrlin(5,:) = mean_LS07(maskmat);
corrlin(6,:) = mean_LS10(maskmat);
end
corr_to_corr
hline_new([0,3,8,13,15]+0.5,'k',2);
vline_new([0,3,8,13,15]+0.5,'k',2);
title('Across Subject Similarity');
corr_to_corr
sub_mats = [];
sub_mats = [sub_mats corrmat];
sub_mats = [];
sub_mats = [sub_mats corrmat];
sub_mats = [sub_mats; corrmat];
corr_to_corr
```

```
two_mean = sub_means;
sub_means = [];
sub_means_2(1,:,:,:) = two_mean;
sub_means_2(sub,:,:,:) = mean_corrmat;
sub_means = sub_means_2;
clear sub_means_2
clear two_mean
for sub = 1:numSubs
for ses = 1:sessions(sub)
tmp = sub_mats(count,:,:,:);
corrlin(count,:) = tmp(maskmat);
count = count + 1;
end
end
sessions(sub)
for sub = 1:numSubs
for ses = 1:sessions(sub)
tmp = sub_mats(count,:,:,:);
corrlin(count,:) = tmp(maskmat);
count = count + 1;
end
end
corr_to_corr
ones(ses,ses)
x = [0:5]
corr_to_corr
tick_labels = {}
tick_labels = {tick}
tick_labels = {tick, tick}
tick_labels = {tick_labels, tick}
tick_labels = {tick_labels tick}
tick_labels = {tick}
tick_labels = {tick_labels tick}
tick_labels = {tick}
tick_labels{end+1} = {tick}
tick_labels{end+1} = tick
corr_to_corr
permutations_cluster_correction
subsampling
addpath '/Users/dianaperez/Documents/GitHub/Lifespan-Analysis'
subsampling
plot(times(1:5),corr(1,:),'Color',[1, 0.5, 0],'LineWidth', 3)
ylim([0 1]);
plot(corr(1,:))
plot(corr(1,1:5))
plot(times(1:5),corr(1,1:5))
plot(times(1:5),corr(1,5),'Color',[1, 0.5, 0],'LineWidth', 3)
ylim([0 1]);
hold on
plot(times, corr(2,:), 'Color', [1,1,0], 'LineWidth', 3)
ylim([0 1]);
hold on
plot(times(1:18),corr(3,1:18),'Color',[0, 0, 1],'LineWidth', 3)
hold on
plot(times(1:5),corr(1,5),'Color',[1, 0.5, 0],'LineWidth', 3)
ylim([0 1]);
hold on
plot(times, corr(2,1:12), 'Color', [1,1,0], 'LineWidth', 3)
ylim([0 1]);
hold on
```

```
plot(times(1:18),corr(3,1:18),'Color',[0, 0, 1],'LineWidth', 3)
hold on
plot(times(1:5),corr(1,5),'Color',[1, 0.5, 0],'LineWidth', 3)
ylim([0 1]);
hold on
plot(times, corr(2,1:12), 'Color', [1,1,0], 'LineWidth', 3)
ylim([0 1]);
hold on
plot(times(1:18),corr(3,1:8),'Color',[0, 0, 1],'LineWidth', 3)
hold on
plot(times(1:5),corr(1,5),'Color',[1, 0.5, 0],'LineWidth', 3)
ylim([0 1]);
hold on
plot(times, corr(2,1:12), 'Color', [1,1,0], 'LineWidth', 3)
ylim([0 1]);
hold on
plot(times(1:8),corr(3,1:8),'Color',[0, 0, 1],'LineWidth', 3)
hold on
plot(times(1:5),corr(1,5),'Color',[1, 0.5, 0],'LineWidth', 3)
ylim([0 1]);
hold on
plot(times(1:12), corr(2,:), 'Color', [1,1,0], 'LineWidth', 3)
ylim([0 1]);
hold on
plot(times(1:8),corr(3,1:8),'Color',[0, 0, 1],'LineWidth', 3)
hold on
plot(times(1:5),corr(1,5),'Color',[1, 0.5, 0],'LineWidth', 3)
ylim([0 1]);
hold on
plot(times(1:12), corr(2,:), 'Color', [1,1,1], 'LineWidth', 3)
ylim([0 1]);
hold on
plot(times(1:8),corr(3,1:8),'Color',[0, 0, 1],'LineWidth', 3)
hold on
figure;
plot(times(1:5),corr(1,5),'Color',[1, 0.5, 0],'LineWidth', 3)
ylim([0 1]);
hold on
plot(times(1:12), corr(2,:), 'Color', [1,1,1], 'LineWidth', 3)
ylim([0 1]);
hold on
plot(times(1:8),corr(3,1:8),'Color',[0, 0, 1],'LineWidth', 3)
hold on
plot(times(1:5),corr(1,5),'Color',[1, 0.5, 0],'LineWidth', 3)
ylim([0 1]);
hold on
plot(times(1:12), corr(2,:), 'Color', [1,1,1], 'LineWidth', 3)
ylim([0 1]);
hold on
plot(times(1:12), corr(2,:), 'Color', [0,0,0], 'LineWidth', 3)
ylim([0 1]);
hold on
plot(times(1:8),corr(3,1:8),'Color',[0, 0, 1],'LineWidth', 3)
hold on
plot(times(1:5),corr(1,5),'Color',[1, 0.5, 1],'LineWidth', 3)
ylim([0 1]);
hold on
figure;
plot(times(1:5),corr(1,5),'Color',[1, 0.5, 1],'LineWidth', 3)
ylim([0 1]);
```

```
hold on
figure;
plot(times(1:5),corr(1,1:5),'Color',[1, 0.5, 0],'LineWidth', 3)
ylim([0 1]);
hold on
plot(times(1:12), corr(2,:), 'Color', [0,0,0], 'LineWidth', 3)
ylim([0 1]);
hold on
plot(times(1:8),corr(3,1:8),'Color',[0, 0, 1],'LineWidth', 3)
hold on
CreateVariantFiles_LS03specific
varmap_first = ft_read_cifti_mod↙
('/Users/dianaperez/Box/Research/Lifespan/LS03_variants_sizeExcluded_first-half_thresh-↙
5_smooth_2.55.dtseries.nii');
varmap_first = ft_read_cifti_mod↙
('/Users/dianaperez/Box/Research/Lifespan/LS03_variants_sizeExcluded_second-half_thresh-↙
5_smooth_2.55.dtseries.nii');
varmap_first = ft_read_cifti_mod↙
('/Users/dianaperez/Box/Research/Lifespan/LS03_variants_sizeExcluded_first-half_thresh-↙
5_smooth_2.55.dtseries.nii');
varmap_second = ft_read_cifti_mod↙
('/Users/dianaperez/Box/Research/Lifespan/LS03_variants_sizeExcluded_second-half_thresh-↙
5_smooth_2.55.dtseries.nii');
clear all
varmap_first = ft_read_cifti_mod↙
('/Users/dianaperez/Box/Research/Lifespan/LS03_variants_sizeExcluded_first-half_thresh-↙
5_smooth_2.55.dtseries.nii');
varmap_second = ft_read_cifti_mod↙
('/Users/dianaperez/Box/Research/Lifespan/LS03_variants_sizeExcluded_second-half_thresh-↙
5_smooth_2.55.dtseries.nii');
data_first = varmap_first.data;
data_second = varmap_first.data;
new_cifti = zeros(data_first);
new_cifti = zeros(data_first,1);
new_cifti = zeros(size(data_first));
for v = 1:length(new_cifti)
if data_first(v,1) == 1 && data_second(v,1) == 1
new_cifti(v,1) == 3;
elseif data_first(v,1) == 1 && data_second(v,1) == 0
new_cifti(v,1) == 1;
elseif data_first(v,1) == 0 && data_second(v,1) == 1
new_cifti(v,1) == 2;
else
disp('Check Variant IDs');
end
end
unique(data_first)
new_cifti = zeros(size(data_first));
for v = 1:length(new_cifti)
if data_first(v,1) == 1 && data_second(v,1) == 1
new_cifti(v,1) == 3;
elseif data_first(v,1) == 1 && data_second(v,1) == 0
new_cifti(v,1) == 1;
elseif data_first(v,1) == 0 && data_second(v,1) == 1
new_cifti(v,1) == 2;
elseif data_first(v,1) == 0 && data_second(v,1) == 0
new_cifti(v,1) == 0;
else
disp('Check Variant IDs');
end
```

```
end
unique(new_cifti)
plot_variant_overlap_splithalf
find(data_first>0)
find(data_second>0)
plot_variant_overlap_splithalf
unique(new_cifti)
plot_variant_overlap_splithalf
data_first(598,1)
data_second(598,1)
plot_variant_overlap_splithalf
unique(new_cifti)
if data_first(598,1) == 1 && data_second(598,1) == 1
disp('hope it works')
end
plot_variant_overlap_splithalf
new_cifti(v)
plot_variant_overlap_splithalf
new_cifti(v)
plot_variant_overlap_splithalf
unique(new_cifti)
varmap_first.data = new_cifti;
ft_write_cifti_mod('/Users/dianaperez/Desktop/sub-LS03_split-half_variant-overlap.↙
dtseries.nii', data_first)
ft_write_cifti_mod('/Users/dianaperez/Desktop/sub-LS03_split-half_variant-overlap.↙
dtseries.nii', varmap_first)
CreateVariantFiles_LS03specific
plot_variant_overlap_splithalf
permutations_make_zmap
CreateVariantFiles_LS03specific
help contains
addpath(genpath('/Users/dianaperez/Documents/GitHub/GrattonLab-General-Repo/FCProcess'))
addpath(genpath('/Users/dianaperez/Documents/GitHub/GrattonLab-General-Repo/FCProcess/'))
subsampling
addpath '/Users/dianaperez/Documents/GitHub/Lifespan-Analysis/Load_nii'
subsampling
figure;
% plot(times(1:5),corr(1,1:5),'Color',[1, 0.5, 0],'LineWidth', 3)
% ylim([0 1]);
% hold on
plot(times(1:12), corr(1,:), 'Color', [1,0.5,0], 'LineWidth', 3)
ylim([0 1]);
hold on
plot(times(1:8),corr(2,1:8),'Color',[0, 0, 1],'LineWidth', 3)
hold on
ylabel('Pearson Correlation (r)');
xlabel('Time (Minutes)');
m = findobj(gca,'Type','line');
hleg1 = legend(m(1:2), 'LS05', 'LS03', 'Location', 'SouthEast');
hleg1.FontSize = 14;
ax = gca;
ax.FontSize = 17;
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.5, 0.7, 0.5, 0.7]);
print(gcf,['/projects/p31161/ReliabilityLifespanRestDatatruhalf' num2str(pts2sample) '.↙
jpg'],'-dpng','-r300');
figure
plot(times(1:12), corr(1,:), 'Color', [1,0.5,0], 'LineWidth', 3)
plot(times, corr(1,:), 'Color', [1,0.5,0], 'LineWidth', 3)
ylim([0 1]);
hold on
```

```
plot(times(1:8),corr(2,1:8),'Color',[0, 0, 1],'LineWidth', 3)
hold on
ylabel('Pearson Correlation (r)');
xlabel('Time (Minutes)');
m = findobj(gca,'Type','line');
hleg1 = legend(m(1:2), 'LS05', 'LS03', 'Location', 'SouthEast');
hleg1.FontSize = 14;
ax = gca;
ax.FontSize = 17;
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.5, 0.7, 0.5, 0.7]);
print(gcf,['/projects/p31161/ReliabilityLifespanRestDatatruhalf' num2str(pts2sample) '.↙
jpg'],'-dpng','-r300');
print(gcf,[output_dir '/ReliabilityLifespanRestDatatruhalf' num2str(pts2sample) '.↙
jpg'],'-dpng','-r300');
times =[5:5:100];
figure;
% plot(times(1:5),corr(1,1:5),'Color',[1, 0.5, 0],'LineWidth', 3)
% ylim([0 1]);
% hold on
plot(times, corr(1,:), 'Color', [1,0.5,0], 'LineWidth', 3)
ylim([0 1]);
hold on
plot(times(1:18),corr(2,1:18),'Color',[0, 0, 1],'LineWidth', 3)
hold on
ylabel('Pearson Correlation (r)');
xlabel('Time (Minutes)');
m = findobj(gca,'Type','line');
hleg1 = legend(m(1:2), 'LS05', 'LS03', 'Location', 'SouthEast');
hleg1.FontSize = 14;
ax = gca;
ax.FontSize = 17;
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.5, 0.7, 0.5, 0.7]);
print(gcf,[output_dir '/ReliabilityLifespanRestDatatruhalf' num2str(pts2sample) '.↙
jpg'],'-dpng','-r300');
corr_to_corr
tmp = mean_LS02;
corrlin(1,:) = tmp(maskmat);
tmp = mean_LS03;
corrlin(2,:) = tmp(maskmat);
tmp = mean_LS04;
corrlin(3,:) = tmp(maskmat);
tmp = mean_LS05;
corrlin(4,:) = tmp(maskmat);
tmp = mean_LS07;
corrlin(5,:) = tmp(maskmat);
tmp = mean_LS10;
corrlin(6,:) = tmp(maskmat);
simmat = corr(corrlin');
clear corr
simmat = corr(corrlin');
figure('Position',[1 1 1000 800]);
imagesc(simmat,[0 1]); colormap('jet');
hline_new([0,1,2,3,4,5,6]+0.5,'k',2);
vline_new([0,1,2,3,4,5,6]+0.5,'k',2);
set(gca,'XTick',[1,2,3,4,5,6], 'YTick', [1,2,3,4,5,6], 'XTickLabel',...
{'LS02', 'LS03', 'LS04', 'LS05', 'LS07', 'LS10}, 'YTickLabel', {'LS02', 'LS03', 'LS05',↙
'LS07'});
axis square;
colorbar;
set(gca,'XTick',[1,2,3,4,5,6], 'YTick', [1,2,3,4,5,6], 'XTickLabel',...
```

```
{'LS02', 'LS03', 'LS04', 'LS05', 'LS07', 'LS10}, 'YTickLabel', {'LS02', 'LS03', 'LS05',↙
'LS07', 'LS10'});
set(gca,'XTick',[1,2,3,4,5,6], 'YTick', [1,2,3,4,5,6], 'XTickLabel',{'LS02', 'LS03',↙
'LS04', 'LS05', 'LS07', 'LS10}, 'YTickLabel', {'LS02', 'LS03', 'LS05', 'LS07', 'LS10'});
set(gca,'XTick',[1,2,3,4,5,6], 'YTick', [1,2,3,4,5,6], 'XTickLabel',{'LS02', 'LS03',↙
'LS04', 'LS05', 'LS07', 'LS10'}, 'YTickLabel', {'LS02', 'LS03', 'LS05', 'LS07', 'LS10'});
title('Similarity Across Subjects')
axis square;
colorbar;
saveas(gcf,[outDir 'SimilarityMat_AcrossSubs.tiff'],'tiff');
maskmat2 = ones(simmat);
maskmat2 = ones(size(simmat));
maskmat2 = logical(triu(maskmat2,1));
sim = simmat(maskmat);
sim = simmat(maskmat2);
mean(sim)
subsampling
%-- 2/28/21, 7:08 PM --%
permutations_cluster_correction
permute_flippedVars
permutations_cluster_correction
clear all
permutations_cluster_correction
permute_flippedVars
permute_flippedVars
permute_flippedVars
template = ft_read_cifti_mod(LH_files{1});
new_cifti = [];
count = 1;
left_hem = length(template.brainstructure)/2;
for i = 1:left_hem
if template.brainstructure(i) == 1
homotopic_overlap
sum(allSubs)
sum(allsubs)
homotopic_overlap
permute_flippedVars
new_cifti = [];
count = 1;
template = ft_read_cifti_mod(LH_files{1});
for i = 1:length(template.brainstructure)
if template.brainstructure(i) > 0
new_cifti(i,1) = trueDiff;
count = count + 1;
else
new_cifti(i,1) = template.brainstructure(i);
end
end
for i = 1:length(template.brainstructure)
if template.brainstructure(i) > 0
new_cifti(i,1) = trueDiff(count);
count = count + 1;
else
new_cifti(i,1) = template.brainstructure(i);
end
end
for i = 1:(length(template.brainstructure)/2)
if template.brainstructure(i) > 0
new_cifti(i,1) = trueDiff;
count = count + 1;
```

```
else
new_cifti(i,1) = template.brainstructure(i);
end
end
left_hem = template.brainstructure(1:(length(template.brainstructure)/2));
for i = 1:(length(left_hem)
if left_hem(i) > 0
new_cifti(i,1) = trueDiff;
count = count + 1;
else
new_cifti(i,1) = left_hem(i);
end
end
for i = 1:length(left_hem)
if left_hem(i) > 0
new_cifti(i,1) = trueDiff;
count = count + 1;
else
new_cifti(i,1) = left_hem(i);
end
end
count = 1;
cifti = [];
for i = 1:length(left_hem)
if left_hem(i) > 0
new_cifti(i,1) = trueDiff(count);
count = count + 1;
else
new_cifti(i,1) = left_hem(i);
end
end
new_cifti = [new_cifti; new_cifti];
new_cifti = new_cifti(template.brainstructure>0);
ft_write_cifti_mod('/Users/dianaperez/Desktop/LH_diffmap.dtseries.nii', new_cifti);
template.data = new_cifti;
ft_write_cifti_mod('/Users/dianaperez/Desktop/LH_diffmap.dtseries.nii', template);
template = ft_read_cifti_mod(LH_files{1});
count = 1;
cifti = [];
for i = 1:length(left_hem)
if left_hem(i) > 0
new_cifti(i,1) = trueDiff(count);
count = count + 1;
else
new_cifti(i,1) = left_hem(i);
end
end
new_cifti = [new_cifti; new_cifti];
new_cifti = new_cifti(template.brainstructure>0);
template.data = new_cifti;
ft_write_cifti_mod('/Users/dianaperez/Desktop/MH_diffmap.dtseries.nii', template);
template = ft_read_cifti_mod(LH_files{1});
count = 1;
cifti = [];
for i = 1:length(left_hem)
if left_hem(i) > 0
new_cifti(i,1) = trueDiff(count);
count = count + 1;
else
new_cifti(i,1) = left_hem(i);
```

```
end
end
new_cifti = [new_cifti; new_cifti];
new_cifti = new_cifti(template.brainstructure>0);
template.data = new_cifti;
ft_write_cifti_mod('/Users/dianaperez/Desktop/RH_diffmap.dtseries.nii', template);
template = ft_read_cifti_mod(LH_files{1});
count = 1;
cifti = [];
for i = 1:length(left_hem)
if left_hem(i) > 0
new_cifti(i,1) = trueDiff(count);
count = count + 1;
else
new_cifti(i,1) = left_hem(i);
end
end
new_cifti = [new_cifti; new_cifti];
new_cifti = new_cifti(template.brainstructure>0);
template.data = new_cifti;
ft_write_cifti_mod('/Users/dianaperez/Desktop/allSubs_diffmap.dtseries.nii', template);
permute_left_right_handers
open make_zmap
template = ft_read_cifti_mod(RH_files{1});
template.data = trueDiff;
ft_write_cifti_mod('/Users/dianaperez/Desktop/permutations_RH-LH_trueDiffMap.dtseries.↙
nii', template);
HCP_assignNetworksToVariants
clear all
HCP_assignNetworksToVariants
size(subs,1)
HCP_assignNetworksToVariants
addpath '/Users/dianaperez/Documents/GitHub/Lifespan-Analysis'
HCP_assignNetworksToVariants
cifti_geo.distances = cifti_geo.distances(1:59412,1:59412);
HCP_assignNetworksToVariants
bold_data = cifti.data;
concat = [bold_data bold_data];
HCP_assignNetworksToVariants
%-- 3/17/21, 1:46 PM --%
permute_flippedVars
get_rid_of_this
64984/2
get_rid_of_this
ft_write_cifti_mod('/Users/dianaperez/Desktop/allSubs_diffmap.dtseries.nii', trueDiff)
template = LH_files(1)/
template = LH_files(1);
template.data = trueDiff;
ft_read_cifti_mod(template)
template = ft_read_cifti_mod(LH_files(1))
template = ft_read_cifti_mod(LH_files{1})
template.data = trueDiff;
ft_write_cifti_mod('/Users/dianaperez/Desktop/allSubs_diffmap.dtseries.nii', template)
load('brain_ind.mat')
find(brain_ind==18330)
find(brain_ind==18330+(64984/2))
find(brain_ind==18988)
find(brain_ind==19070+(64984/2))
neigh = load↙
('/Users/dianaperez/Box/Quest_Backup/Scripts/CIFTI_RELATED/Resources/Conte69_atlas-v2.LR.↙
```

```
32k_fs_LR.wb/Cifti_surf_neighbors_LR_normalwall.mat');
neigh = neigh.neighbors;
min_subject_threshold= .04;
clear all
fname =↙
'/Volumes/GRATTONLAB/HCP/Variants/networkAssignments/Templatematch_spCorr_bysubject_IDs_r↙
eassigned.dtseries.nii';
diffmap = ft_read_cifti_mod('/Users/dianaperez/Desktop/allSubs_diffmap.dtseries.nii');
netvars = ft_read_cifti_mod(fname);
neigh = load↙
('/Users/dianaperez/Box/Quest_Backup/Scripts/CIFTI_RELATED/Resources/Conte69_atlas-v2.LR.↙
32k_fs_LR.wb/Cifti_surf_neighbors_LR_normalwall.mat');
neigh = neigh.neighbors;
min_subject_threshold= .04;
diffmat_bin= logical(abs(diffmap.data)>= min_subject_threshold);
VOI = 46334;
mask = VOI;
neigh(VOI)
neigh(VOI,:)
for n = 1:7
if diffmat_bin(neigh(VOI,n))
mask = [mask; neigh(VOI,n)];
end
end
mask = VOI;
for n = 1:7
if diffmat_bin(neigh(VOI,n))
mask = [mask; neigh(VOI,n)];
end
end
mask = unique(mask)
for m = 1:length(mask)
for n = 1:7
if diffmat_bin(neigh(m,n))
mask = [mask; neigh(m,n)];
end
end
mask = unique(mask);
end
length(mask)
neigh(m,n)
for m = 1:length(mask)
for n = 1:7
if diffmat_bin(neigh(mask(m),n))
mask = [mask; neigh(mask(m),n)];
end
end
mask = unique(mask);
end
unique(mask)
for m = 1:length(mask)
for n = 1:7
if diffmat_bin(neigh(mask(m),n))
mask = [mask; neigh(mask(m),n)];
end
end
mask = unique(mask);
end
diffmat_bin(mask)
for m = 1:length(mask)
```

```
for n = 1:7
if diffmat_bin(neigh(mask(m),n))
mask = [mask; neigh(mask(m),n)];
end
end
mask = unique(mask);
end
new_cifti = zeros(59412,1);
new_cifti(mask) == 1;
template = diffmap;
template.data = new_cifti;
ft_write_cifti_mod('/Users/dianaperez/Desktop/HCP_operculum_variant_cluster_mask.↙
dtseries.nii', template);
unique(new_cifti)
new_cifti(mask) = 1;
unique(new_cifti)
template.data = new_cifti;
ft_write_cifti_mod('/Users/dianaperez/Desktop/HCP_operculum_variant_cluster_mask.↙
dtseries.nii', template);
clear all
fname =↙
'/Volumes/GRATTONLAB/HCP/Variants/networkAssignments/Templatematch_spCorr_bysubject_IDs_r↙
eassigned.dtseries.nii';
maskname = '/Users/dianaperez/Desktop/HCP_operculum_variant_cluster_mask.dtseries.nii';
netvars = ft_read_cifti_mod(fname);
ROI_mask = ft_read_cifti_mod(maskname);
uiopen('/Users/dianaperez/Desktop/HCPsublist.txt',1)
load('/Users/dianaperez/Box/Research/Lateralization_Variants/subjectData/goodSubs384.↙
mat')
load('/Users/dianaperez/Box/Research/Lateralization_Variants/subjectData/goodSubs752.↙
mat')
goodSubs384 = goodSubs384(:,1);
goodSubs752 = goodSubs752(:,1);
help sort
goodSubs384 = sort(goodSubs384,'descend');
goodSubs752 = sort(goodSubs752,'descend');
goodSubs384 = sort(goodSubs384,'ascend');
goodSubs752 = sort(goodSubs752,'ascend');
netvars382 = [];
help ismember
for s = 1:length(goodSubs752)
if ismember(goodSubs752(s),goodSubs384)
netvars382 = [netvars382 netvars.data(:,s)];
end
end
variants_of_interest = netvars382(ROI_mask, :);
variants_of_interest = netvars382(ROI_mask.data, :);
verts_of_interest = ROI_mask.data(ROI_mask.data==1);
variants_of_interest = netvars382(verts_of_interest, :);
get_network_IDs = unique(variants_of_interest);
verts_of_interest = find(ROI_mask.data==1);
variants_of_interest = netvars382(verts_of_interest, :);
get_network_IDs = unique(variants_of_interest);
c = 2;
num_verts_per_net(c,1) = get_networks_IDs(c);
num_verts_per_net(c,1) = get_network_IDs(c);
num_verts_per_net(c,1) = get_networks_IDs(c);
num_verts_per_net(c,1) = get_network_IDs(c);
num_verts = find(verts_of_interest==get_network_IDs(c));
find(verts_of_interest=get_network_IDs(c))
```

```
find(verts_of_interest==get_network_IDs(c))
num_verts = find(variants_of_interest==get_network_IDs(c));
num_verts_per_net(c,2) = length(num_verts);
for c = 1:length(get_network_IDs)
num_verts_per_net(c,1) = get_network_IDs(c);
num_verts = find(variants_of_interest==get_network_IDs(c));
num_verts_per_net(c,2) = length(num_verts);
end
num_verts_per_net = num_verts_per_net(2:end,:);
pie(num_verts_per_net)
find(variants_of_interest>0);
clear all
fname =↙
'/Volumes/GRATTONLAB/HCP/Variants/networkAssignments/Templatematch_spCorr_bysubject_IDs_r↙
eassigned.dtseries.nii';
% diffmap = ft_read_cifti_mod('/Users/dianaperez/Desktop/allSubs_diffmap.dtseries.nii');
diffmap = ft_read_cifti_mod('/Users/dianaperez/Desktop/HCP_RH-↙
LH_diffMap_384GoodSubs_thresh7.5.dtseries.nii');
netvars = ft_read_cifti_mod(fname);
neigh = load↙
('/Users/dianaperez/Box/Quest_Backup/Scripts/CIFTI_RELATED/Resources/Conte69_atlas-v2.LR.↙
32k_fs_LR.wb/Cifti_surf_neighbors_LR_normalwall.mat');
neigh = neigh.neighbors;
min_subject_threshold= .04;
diffmat_bin= logical(abs(diffmap.data)>= min_subject_threshold);
VOI = 16620;
mask = VOI;
for n = 1:7
if diffmat_bin(neigh(VOI,n))
mask = [mask; neigh(VOI,n)];
end
end
for m = 1:length(mask)
for n = 1:7
if diffmat_bin(neigh(mask(m),n))
mask = [mask; neigh(mask(m),n)];
end
end
mask = unique(mask);
end
for n = 1:7
if diffmat_bin(neigh(VOI,n))
mask = [mask; neigh(VOI,n)];
end
end
mask = unique(mask);
neigh(VOI,1)
diffmat_bin(neigh(VOI,1))
diffmat_bin(neigh(VOI,2))
diffmat_bin(neigh(VOI,3))
diffmat_bin(neigh(VOI,4))
diffmat_bin(neigh(VOI,5))
diffmat_bin(neigh(VOI,6))
diffmat_bin(neigh(VOI,7))
VOI = 16487;
for n = 1:7
if diffmat_bin(neigh(VOI,n))
mask = [mask; neigh(VOI,n)];
end
end
```

```
for m = 1:length(mask)
for n = 1:7
if diffmat_bin(neigh(mask(m),n))
mask = [mask; neigh(mask(m),n)];
end
end
mask = unique(mask);
end
new_cifti = zeros(59412,1);
new_cifti(mask) = 1;
template = diffmap;
template.data = new_cifti;
ft_write_cifti_mod('/Users/dianaperez/Desktop/HCP_operculum_Lefthem_variant_cluster_mask.↙
dtseries.nii', template);
VOI = 17278;
mask = VOI;
for n = 1:7
if diffmat_bin(neigh(VOI,n))
mask = [mask; neigh(VOI,n)];
end
end
mask = unique(mask);
for m = 1:length(mask)
for n = 1:7
if diffmat_bin(neigh(mask(m),n))
mask = [mask; neigh(mask(m),n)];
end
end
mask = unique(mask);
end
new_cifti = zeros(59412,1);
new_cifti(mask) = 1;
template = diffmap;
template.data = new_cifti;
ft_write_cifti_mod↙
('/Users/dianaperez/Desktop/HCP_operculum_Lefthem_variant_cluster_mask_RHvsLH.dtseries.↙
nii', template);
VOI = 47074;
mask = VOI;
for n = 1:7
if diffmat_bin(neigh(VOI,n))
mask = [mask; neigh(VOI,n)];
end
end
mask = unique(mask);
for m = 1:length(mask)
for n = 1:7
if diffmat_bin(neigh(mask(m),n))
mask = [mask; neigh(mask(m),n)];
end
end
mask = unique(mask);
end
xfor m = 1:length(mask)
for n = 1:7
if diffmat_bin(neigh(mask(m),n))
mask = [mask; neigh(mask(m),n)];
end
end
mask = unique(mask);
```

```
end
for m = 1:length(mask)
for n = 1:7
if diffmat_bin(neigh(mask(m),n))
mask = [mask; neigh(mask(m),n)];
end
end
mask = unique(mask);
end
help isnan
for m = 1:length(mask)
neighbors = neigh(mask(m),n);
neigh_ind = isnan(neighbors);
neighbors = neighbors(neigh_ind=0);
for n = 1:length(neighbors)
if diffmat_bin(neighbors(m))
mask = [mask; neighbors(m)];
end
end
mask = unique(mask);
end
for m = 1:length(mask)
neighbors = neigh(mask(m),n);
neigh_ind = isnan(neighbors);
neighbors = neighbors(neigh_ind==0);
for n = 1:length(neighbors)
if diffmat_bin(neighbors(m))
mask = [mask; neighbors(m)];
end
end
mask = unique(mask);
end
min_subject_threshold= -.04;
%diffmat_bin= logical(abs(diffmap.data)>= min_subject_threshold);
diffmat_bin= logical(diffmap.data<= min_subject_threshold);
VOI = 47074;
mask = VOI;
for n = 1:7
if diffmat_bin(neigh(VOI,n))
mask = [mask; neigh(VOI,n)];
end
end
for m = 1:length(mask)
neighbors = neigh(mask(m),n);
neigh_ind = isnan(neighbors);
neighbors = neighbors(neigh_ind==0);
for n = 1:length(neighbors)
if diffmat_bin(neighbors(m))
mask = [mask; neighbors(m)];
end
end
mask = unique(mask);
end
make_operculum_mask
for m = 1:length(mask)
neighbors = neigh(mask(m),:);
neigh_ind = isnan(neighbors);
neighbors = neighbors(neigh_ind==0);
for n = 1:length(neighbors)
if diffmat_bin(neighbors(n))
```

```
mask = [mask; neighbors(n)];
end
end
mask = unique(mask);
end
new_cifti = zeros(59412,1);
new_cifti(mask) = 1;
template = diffmap;
template.data = new_cifti;
ft_write_cifti_mod↙
('/Users/dianaperez/Desktop/HCP_operculum_Righthem_variant_cluster_mask_RHvsLH.dtseries.↙
nii', template);
VOI = 17278;
mask = VOI;
for n = 1:7
if diffmat_bin(neigh(VOI,n))
mask = [mask; neigh(VOI,n)];
end
end
for m = 1:length(mask)
neighbors = neigh(mask(m),:);
neigh_ind = isnan(neighbors);
neighbors = neighbors(neigh_ind==0);
for n = 1:length(neighbors)
if diffmat_bin(neighbors(n))
mask = [mask; neighbors(n)];
end
end
mask = unique(mask);
end
for m = 1:length(mask)
neighbors = neigh(mask(m),:);
neigh_ind = isnan(neighbors);
neighbors = neighbors(neigh_ind==0);
for n = 1:length(neighbors)
if diffmat_bin(neighbors(n))
mask = [mask; neighbors(n)];
end
end
mask = unique(mask);
end
new_cifti = zeros(59412,1);
new_cifti(mask) = 1;
template = diffmap;
template.data = new_cifti;
ft_write_cifti_mod↙
('/Users/dianaperez/Desktop/HCP_operculum_Lefthem_variant_cluster_mask_RHvsLH.dtseries.↙
nii', template);
diffmap = ft_read_cifti_mod('/Users/dianaperez/Desktop/allSubs_diffmap.dtseries.nii');
min_subject_threshold= .04;
diffmat_bin= logical(abs(diffmap.data)>= min_subject_threshold);
%diffmat_bin= logical(diffmap.data<= min_subject_threshold);
VOI = 16487;
mask = VOI;
for n = 1:7
if diffmat_bin(neigh(VOI,n))
mask = [mask; neigh(VOI,n)];
end
end
for m = 1:length(mask)
```

```
neighbors = neigh(mask(m),:);
neigh_ind = isnan(neighbors);
neighbors = neighbors(neigh_ind==0);
for n = 1:length(neighbors)
if diffmat_bin(neighbors(n))
mask = [mask; neighbors(n)];
end
end
mask = unique(mask);
end
for n = 1:7
if diffmat_bin(neigh(VOI,n))
mask = [mask; neigh(VOI,n)];
end
end
VOI = 16566;
mask = VOI;
for n = 1:7
if diffmat_bin(neigh(VOI,n))
mask = [mask; neigh(VOI,n)];
end
end
for m = 1:length(mask)
neighbors = neigh(mask(m),:);
neigh_ind = isnan(neighbors);
neighbors = neighbors(neigh_ind==0);
for n = 1:length(neighbors)
if diffmat_bin(neighbors(n))
mask = [mask; neighbors(n)];
end
end
mask = unique(mask);
end
new_cifti = zeros(59412,1);
new_cifti(mask) = 1;
template = diffmap;
template.data = new_cifti;
ft_write_cifti_mod('/Users/dianaperez/Desktop/HCP_operculum_Lefthem_variant_cluster_mask.↙
dtseries.nii', template);
VOI = 46334;
mask = VOI;
for n = 1:7
if diffmat_bin(neigh(VOI,n))
mask = [mask; neigh(VOI,n)];
end
end
for m = 1:length(mask)
neighbors = neigh(mask(m),:);
neigh_ind = isnan(neighbors);
neighbors = neighbors(neigh_ind==0);
for n = 1:length(neighbors)
if diffmat_bin(neighbors(n))
mask = [mask; neighbors(n)];
end
end
mask = unique(mask);
end
new_cifti = zeros(59412,1);
new_cifti(mask) = 1;
template = diffmap;
```

```
template.data = new_cifti;
ft_write_cifti_mod↙
('/Users/dianaperez/Desktop/HCP_operculum_Righthem_variant_cluster_mask.dtseries.nii',↙
template);
maskname = '/Users/dianaperez/Desktop/HCP_operculum_Righthem_variant_cluster_mask.↙
dtseries.nii';
ROI_mask = ft_read_cifti_mod(maskname);
load('/Users/dianaperez/Box/Research/Lateralization_Variants/subjectData/goodSubs384.↙
mat')
load('/Users/dianaperez/Box/Research/Lateralization_Variants/subjectData/goodSubs752.↙
mat')
goodSubs384 = goodSubs384(:,1);
goodSubs752 = goodSubs752(:,1);
goodSubs384 = sort(goodSubs384,'ascend');
goodSubs752 = sort(goodSubs752,'ascend');
netvars382 = [];
for s = 1:length(goodSubs752)
if ismember(goodSubs752(s),goodSubs384)
netvars382 = [netvars382 netvars.data(:,s)];
end
end
verts_of_interest = find(ROI_mask.data==1);
variants_of_interest = netvars382(verts_of_interest, :);
network_IDs = unique(variants_of_interest);
num_verts_per_net = [];
for c = 1:length(network_IDs)
num_verts_per_net(c,1) = network_IDs(c);
num_verts = find(variants_of_interest==network_IDs(c));
num_verts_per_net(c,2) = length(num_verts);
end
num_verts_per_net = num_verts_per_net(2:end,:);
maskname = '/Users/dianaperez/Desktop/HCP_operculum_Lefthem_variant_cluster_mask.↙
dtseries.nii';
ROI_mask = ft_read_cifti_mod(maskname);
clear verts_of_interest
clear variants_of_interest
clear networks_IDs
verts_of_interest = find(ROI_mask.data==1);
variants_of_interest = netvars382(verts_of_interest, :);
network_IDs = unique(variants_of_interest);
num_verts_per_net = [];
for c = 1:length(network_IDs)
num_verts_per_net(c,1) = network_IDs(c);
num_verts = find(variants_of_interest==network_IDs(c));
num_verts_per_net(c,2) = length(num_verts);
end
num_verts_per_net = num_verts_per_net(2:end,:);
maskname = '/Users/dianaperez/Desktop/HCP_operculum_Righthem_variant_cluster_mask.↙
dtseries.nii';
ROI_mask = ft_read_cifti_mod(maskname);
clear networks_IDs
clear variants_of_interest
clear verts_of_interest
verts_of_interest = find(ROI_mask.data==1);
variants_of_interest = netvars382(verts_of_interest, :);
network_IDs = unique(variants_of_interest);
num_verts_per_net = [];
for c = 1:length(network_IDs)
num_verts_per_net(c,1) = network_IDs(c);
num_verts = find(variants_of_interest==network_IDs(c));
```

```
num_verts_per_net(c,2) = length(num_verts);
end
num_verts_per_net = num_verts_per_net(2:end,:);
clear networks_IDs
clear variants_of_interest
clear verts_of_interest
maskname = '/Users/dianaperez/Desktop/HCP_operculum_Righthem_variant_cluster_mask_RHvsLH.↙
dtseries.nii';
ROI_mask = ft_read_cifti_mod(maskname);
load('/Users/dianaperez/Box/Research/Lateralization_Variants/subjectData/goodSubs384.↙
mat')
load('/Users/dianaperez/Box/Research/Lateralization_Variants/subjectData/goodSubs752.↙
mat')
goodSubs384 = sort(goodSubs384,'ascend');
goodSubs752 = sort(goodSubs752,'ascend');
help sort
load('/Users/dianaperez/Box/Research/Lateralization_Variants/subjectData/goodSubs384.↙
mat')
load('/Users/dianaperez/Box/Research/Lateralization_Variants/subjectData/goodSubs752.↙
mat')
sortrows(goodSubs384,1)
goodSubs384 = ans;
goodSubs752 = sort(goodSubs752,'ascend');
netvars384 = [];
for s = 1:length(goodSubs752)
if ismember(goodSubs752(s),goodSubs384)
netvars384 = [netvars384 netvars.data(:,s)];
end
end
netvarsLH = [];
netvarsMH = [];
netvarsRH = [];
for s = 1:length(goodSubs384)
if goodSubs384(s,2) < -28
netvarsLH = [netvarsLH; netvars384(:,s)];
elseif goodSubs384(s,2) < 48
netvarsMH = [netvarsMH; netvars384(:,s)];
elseif goodSubs384(s,2) <= 100
netvarsRH = [netvarsRH; netvars384(:,s)];
end
end
verts_of_interest = find(ROI_mask.data==1);
netvarsLH = [];
netvarsMH = [];
netvarsRH = [];
for s = 1:length(goodSubs384)
if goodSubs384(s,2) < -28
netvarsLH = [netvarsLH netvars384(:,s)];
elseif goodSubs384(s,2) < 48
netvarsMH = [netvarsMH netvars384(:,s)];
elseif goodSubs384(s,2) <= 100
netvarsRH = [netvarsRH netvars384(:,s)];
end
end
verts_of_interest = find(ROI_mask.data==1);
variants_of_interest = netvarsLH(verts_of_interest, :);
network_IDs = unique(variants_of_interest);
for c = 1:length(network_IDs)
num_verts_per_net(c,1) = network_IDs(c);
num_verts = find(variants_of_interest==network_IDs(c));
```

```
num_verts_per_net(c,2) = length(num_verts);
end
num_verts_per_net = num_verts_per_net(2:end,:);
clear verts_of_interest
clear variants_of_interest
clear networks_IDs
verts_of_interest = find(ROI_mask.data==1);
variants_of_interest = netvarsRH(verts_of_interest, :);
network_IDs = unique(variants_of_interest);
num_verts_per_net = [];
for c = 1:length(network_IDs)
num_verts_per_net(c,1) = network_IDs(c);
num_verts = find(variants_of_interest==network_IDs(c));
num_verts_per_net(c,2) = length(num_verts);
end
num_verts_per_net = num_verts_per_net(2:end,:);
maskname = '/Users/dianaperez/Desktop/HCP_operculum_Lefthem_variant_cluster_mask_RHvsLH.↙
dtseries.nii';
ROI_mask = ft_read_cifti_mod(maskname);
clear verts_of_interest
clear variants_of_interest
clear network_IDs
verts_of_interest = find(ROI_mask.data==1);
variants_of_interest = netvarsRH(verts_of_interest, :);
network_IDs = unique(variants_of_interest);
num_verts_per_net = [];
for c = 1:length(network_IDs)
num_verts_per_net(c,1) = network_IDs(c);
num_verts = find(variants_of_interest==network_IDs(c));
num_verts_per_net(c,2) = length(num_verts);
end
num_verts_per_net = num_verts_per_net(2:end,:);
clear network_IDs
clear verts_of_interest
clear variants_of_interest
verts_of_interest = find(ROI_mask.data==1);
variants_of_interest = netvarsLH(verts_of_interest, :);
network_IDs = unique(variants_of_interest);
num_verts_per_net = [];
for c = 1:length(network_IDs)
num_verts_per_net(c,1) = network_IDs(c);
num_verts = find(variants_of_interest==network_IDs(c));
num_verts_per_net(c,2) = length(num_verts);
end
num_verts_per_net = num_verts_per_net(2:end,:);
maskname = '/Users/dianaperez/Desktop/HCP_operculum_Righthem_variant_cluster_mask.↙
dtseries.nii';
ROI_mask = ft_read_cifti_mod(maskname);
verts_of_interest = find(ROI_mask.data==1);
%-- 3/28/21, 2:12 PM --%
corr_to_corr
%-- 4/8/21, 9:20 PM --%
overlapmap_gender
females(1)
overlapmap_gender
permute_flippedVars
permute_flippedVars
%-- 4/28/21, 10:05 AM --%
cd /Users/dianaperez/Box/DATA
dir(BOLD_DATA)
```

```
dir('BOLD_DATA')
ff = dir('BOLD_DATA');
folder_1 = ff.name(3:2500);
folder_1 = ff.name{3:2500};
folder_1 = ff.name(3:2500,1);
folder_names = ff.name;
folder_names = ff.name(3:end);
folder_names = ff.name{3:end};
ff.name
ff.name{1}
ff.name(1)
ff.name(,11)
ff.name(1,1)
ff.name{1,1}
name = {ff.name}.';
folder_names = {ff.name(3:end)}
folder_names = {ff.name{3:end}};
folder_names = {ff.name{3:end,1}};
folder_names = {ff.name};
folder_names = name;
folder_names = folder_names(3:end);
folder_1 = folder_names(1:2500);
writeTable(folder_1, 'BOLD_DATA_1.txt')
writetable(folder_1, 'BOLD_DATA_1.txt')
writecell(folder_1, 'BOLD_DATA_1.txt')
folder_1 = folder_names(1:3000);
folder_1 = folder_names(1:2000);
writecell(folder_1, 'BOLD_DATA_1.txt')
writecell(folder_1, 'BOLD_DATA_2.txt')
folder_1 = folder_names(1:2500);
folder_1 = folder_names(1:3000);
writecell(folder_1, 'BOLD_DATA_1.txt')
permute_flippedVars
unique(new_cifti)
unique(right_hem)
unique(left_hem)
find(left_hem ==1)
find(cifti.data ==1)
ff = find(left_hem ==1);
ee = find(cifti.data ==1)
ee = find(cifti.data>0)
dd = find(right_hem ==1);
size(dd) + size(ff)
load('/Users/dianaperez/Desktop/Lateralization_thresh10/AvgVariantSizesByHem_10thresh.↙
mat')
clear all
load('/Users/dianaperez/Desktop/Lateralization_thresh10/AvgVariantSizesByHem_10thresh.↙
mat')
allSubs_avg = average{1,4};
histogram(allSubs_avg(:,1))
hold on
histogram(allSubs_avg(:,2))
ax = gca;
ax.FontSize = 15;
xlabel('Number of Subjects')
ylabel(
ylabel('Average Variant Size')
legend('Left Hem', 'Right Hem')
title('Average Variant Size x Hemisphere')
LH_avg = average{1,1};
```

```
histogram(LH_avg(:,1))
hold on
histogram(LH_avg(:,2))
ax = gca;
ax.FontSize = 15;
xlabel('Number of Subjects')
ylabel('Average Variant Size')
legend('Left Hem', 'Right Hem')
title('Average Variant Size x Hemisphere - Left Handers')
RH_avg = average{1,2};
histogram(RH_avg(:,1))
hold on
histogram(RH_avg(:,2))
ax = gca;
ax.FontSize = 15;
xlabel('Number of Subjects')
ylabel('Average Variant Size')
legend('Left Hem', 'Right Hem')
title('Average Variant Size x Hemisphere - Right Handers')
load('/Users/dianaperez/Desktop/Lateralization_thresh10/VariantSizesByHem_10thresh.mat')
allSubs_left = varsizexhem{1,4{1,1};
allSubs_left = varsizexhem{1,4}{1,1};
allSubs_right = varsizexhem{1,4}{1,2};
histogram(allSubs_left)
hold on
histogram(allSubs_right)
legend('Left Hem', 'Right Hem')
help dist
h = histogram(allSubs_left)
hold on
histogram(allSubs_right)
%-- 5/6/21, 11:34 AM --%
load('/Users/dianaperez/Desktop/Lateralization_thresh10/AvgVariantSizesByHem_10thresh.↙
mat')
size = average{1,1};
left = size(:.1);
left = size(:,1);
right = size(:,2);
histogram(left, 20);
histogram(left, 30);
hold on
histogram(right,30);
ax = gca;
permute_flippedVars
clear all
permute_flippedVars
%-- 5/6/21, 3:38 PM --%
corr_to_corr
network_seg
addpath(genpath('/Volumes/Research_HD/Dependencies'))
network_seg
mean(between)
mean(between, 'omitnan')
network_seg
%-- 5/7/21, 10:21 PM --%
run('/Users/dianaperez/Desktop/Week6_diana.m')
%-- 5/19/21, 2:52 PM --%
permute_flippedVars
permutations_cluster_correction
clear all
```

```
uiopen↙
('/Volumes/GRATTONLAB/HCP/Variants/networkAssignments/Templatematch_spCorr_bysubject_IDs_↙
reassigned.dtseries.nii',1)
net_assigment = ft_read_cifti_mod↙
('/Volumes/GRATTONLAB/HCP/Variants/networkAssignments/Templatematch_spCorr_bysubject_IDs_↙
reassigned.dtseries.nii');
%-- 5/22/21, 1:44 PM --%
net_assigment = ft_read_cifti_mod↙
('/Volumes/GRATTONLAB/HCP/Variants/networkAssignments/Templatematch_spCorr_bysubject_IDs_↙
reassigned.dtseries.nii');
startup
net_assigment = ft_read_cifti_mod↙
('/Volumes/GRATTONLAB/HCP/Variants/networkAssignments/Templatematch_spCorr_bysubject_IDs_↙
reassigned.dtseries.nii');
left_hem = net_assignment.data(net_assignment.brainstructure==1);
brain = net_assigment.brainstructure(net_assigment.brainstructure>0);
left_hem = net_assignment.data(brain==1);
left_hem = net_assigment.data(brain==1);
right_hem = net_assigment.data(brain==2);
left_hem_nets = unique(left_hem);
right_hem_nets = unique(right_hem);
num_verts_per_net = [];
for n = 1:length(left_hem_nets)
num_verts_per_net(n,1) = left_hem_nets(n);
num_verts = find(left_hem==left_hem_nets(n));
num_verts_per_net(n,2) = length(num_verts);
end
num_verts_per_net_left = num_verts_per_net;
for n = 1:length(right_hem_nets)
num_verts_per_net(n,1) = right_hem_nets(n);
num_verts = find(right_hem==right_hem_nets(n));
num_verts_per_net(n,2) = length(num_verts);
end
left_hem = net_assignment.data(net_assignment.brainstructure==1,:);
left_hem = net_assignment.data(net_assigment.brainstructure==1,:);
left_hem = net_assigment.data(net_assigment.brainstructure==1,:);
right_hem = net_assigment.data(net_assigment.brainstructure==2,:);
left_hem = net_assigment.data(brain==1,:);
right_hem = net_assigment.data(brain==2,:);
unique(net_assignment.data);
unique(net_assigment.data);
num_verts_per_net = [];
networks = [1:16];
clear num_verts right_hem_nets left_hem_nets
clear ans
clear n
clear num_verts_per_net_left
networks = [1:16];
num_verts_per_net = [];
for n = 1:length(networks)
num_verts_per_net(n,1) = networks(n);
num_verts_per_net(n,2) = length(find(left_hem==networks(n)));
num_verts_per_net(n,3) = length(find(right_hem==networks(n)));
end
pie(num_verts_per_net(:,2))
for n = 1:length(networks)
num_verts_per_net(n,1) = networks(n);
num_verts_per_net(n,2) = length(find(left_hem==networks(n)));
num_verts_per_net(n,3) = length(find(right_hem==networks(n)));
for s = 1:size(left_hem,2)
```

```
per_subject(s,1) = s;
per_subject(s,2) = length(find(left_hem(:,s)==networks(n)));
per_subject(s,3) = length(find(right_hem(:,s)==networks(n)));
end
end
for n = 1:length(networks)
num_verts_per_net(n,1) = networks(n);
num_verts_per_net(n,2) = length(find(left_hem==networks(n)));
num_verts_per_net(n,3) = length(find(right_hem==networks(n)));
for s = 1:size(left_hem,2)
per_subject(s,1,n) = s;
per_subject(s,2,n) = length(find(left_hem(:,s)==networks(n)));
per_subject(s,3,n) = length(find(right_hem(:,s)==networks(n)));
end
end
num_verts_per_net = [];
count = 1;
for n = 1:length(networks)
num_verts_per_net(n,1) = networks(n);
num_verts_per_net(n,2) = length(find(left_hem==networks(n)));
num_verts_per_net(n,3) = length(find(right_hem==networks(n)));
for s = 1:size(left_hem,2)
per_subject(s,count) = s;
count = count + 1;
per_subject(s,count) = length(find(left_hem(:,s)==networks(n)));
count = count + 1;
per_subject(s,count) = length(find(right_hem(:,s)==networks(n)));
count = count + 1;
end
end
clear per_subject
num_verts_per_net = [];
count = 1;
for n = 1:length(networks)
num_verts_per_net(n,1) = networks(n);
num_verts_per_net(n,2) = length(find(left_hem==networks(n)));
num_verts_per_net(n,3) = length(find(right_hem==networks(n)));
for s = 1:size(left_hem,2)
per_subject(s,count) = s;
count = count + 1;
per_subject(s,count) = length(find(left_hem(:,s)==networks(n)));
count = count + 1;
per_subject(s,count) = length(find(right_hem(:,s)==networks(n)));
count = count + 1;
end
end
count = 1;
for n = 1:length(networks)
num_verts_per_net(n,1) = networks(n);
num_verts_per_net(n,2) = length(find(left_hem==networks(n)));
num_verts_per_net(n,3) = length(find(right_hem==networks(n)));
for s = 1:size(left_hem,2)
per_subject(s,count) = length(find(left_hem(:,s)==networks(n)));
count = count + 1;
per_subject(s,count) = length(find(right_hem(:,s)==networks(n)));
count = count + 1;
end
end
clear per_subject
num_verts_per_net = [];
```

```
for n = 1:length(networks)
num_verts_per_net(n,1) = networks(n);
num_verts_per_net(n,2) = length(find(left_hem==networks(n)));
num_verts_per_net(n,3) = length(find(right_hem==networks(n)));
count = 1;
for s = 1:size(left_hem,2)
per_subject(s,count) = s;
count = count + 1;
per_subject(s,count) = length(find(left_hem(:,s)==networks(n)));
count = count + 1;
per_subject(s,count) = length(find(right_hem(:,s)==networks(n)));
count = count + 1;
end
end
clear per_subject
for s = 1:size(left_hem,2)
count = 1;
for n = 1:length(networks)
per_subject(s,count) = s;
count = count + 1;
per_subject(s,count) = length(find(left_hem(:,s)==networks(n)));
count = count + 1;
per_subject(s,count) = length(find(right_hem(:,s)==networks(n)));
count = count + 1;
end
end
networks_by_hem
%-- 5/22/21, 3:15 PM --%
networks_by_hem
startup
networks_by_hem
left_hem(:,s)
find(left_hem(:,s)==networks(n))
clear per
clear per_subject
for s = 1:size(left_hem,2)
count = 1;
per_subject(s,count) = s;
count = count + 1;
for n = 1:length(networks)
per_subject(s,count) = s;
count = count + 1;
per_subject(s,count) = length(find(left_hem(:,s)==networks(n)));
count = count + 1;
per_subject(s,count) = length(find(right_hem(:,s)==networks(n)));
count = count + 1;
end
end
clear per_subject
for s = 1:size(left_hem,2)
count = 1;
per_subject(s,count) = s;
count = count + 1;
for n = 1:length(networks)
per_subject(s,count) = length(find(left_hem(:,s)==networks(n)));
count = count + 1;
per_subject(s,count) = length(find(right_hem(:,s)==networks(n)));
count = count + 1;
end
end
```

```
histogram(per_subject(:,6))
hold on
histogram(per_subject(:,7))
ax = gca
ax.FontSize = 15;
title('Frontoparietal Network Number of Vertices')
legend('Left Hem', 'Right Hem')
xlabel('Number of Vertices')
ylabel('Number of Subjects')
histogram(per_subject(:,14))
hold on
histogram(per_subject(:,15))
ax = gca
ax.FontSize = 15;
title('Ventral Attention Network')
legend('Left Hem', 'Right Hem')
xlabel('Number of Vertices')
ylabel('Number of Subjects')
histogram(per_subject(:,18))
hold on
histogram(per_subject(:,19))
ax = gca
ax.FontSize = 15;
title('Cingulo-opercular Network')
xlabel('Number of Vertices')
ylabel('Number of Subjects')
legend('Left Hem', 'Right Hem')
network_seg
atlas_dir = '/Users/dianaperez/Box/Dependencies/';
atlas = 'Seitzman300';
atlas_params = atlas_parameters_GrattonLab(atlas,atlas_dir);
corr_to_corr
datadir = '/Users/dianaperez/Box/corrmats_Seitzman300/';
corr_to_corr
mean_corrmat(1,:,:)
mean_corrmat(4,:,:)
mean_corrmat(3,:,:)
maskmat = ones(atlas_params.num_rois);
maskmat = logical(triu(maskmat,1));
count = 1;
for s = 1:6
tmp = mean_corrmat(s,:,:,:);
corrlin(count,:) = tmp(maskmat);
count = count+1;
end
for s = 1:6
figure_corrmat_GrattonLab(squeeze(mean_corrmat(s,:,:,:)),atlas_params, -0.4,1);
title(['AllSessAvg, Subject ' subs{s}]);
colormap('jet');
saveas(gcf, [outDir 'Corrmat_' subs{s} 'sessmean.tiff'], 'tiff');
end
for s = 1:6
figure_corrmat_GrattonLab(squeeze(mean_corrmat(s,:,:,:)),atlas_params, -1,1);
title(['AllSessAvg, Subject ' subs{s}]);
saveas(gcf, [outDir 'Corrmat_' subs{s} 'sessmean.tiff'], 'tiff');
end
mean_LS02 = mean_corrmat(1,:,:,:);
clear all
datadir = '/Users/dianaperez/Box/corrmats_Seitzman300/';
data = load(sprintf('%s/sub-%s/sub-%s_sess-%d_task-rest_corrmat_Seitzman300.mat',↙
```

```
datadir, subs{sub}, subs{sub}, ses));
data = load(sprintf('%s/sub-%s/sub-%s_sess-%d_task-rest_corrmat_Seitzman300.mat',↙
datadir, 'LS02', 'LS02', 1));
mean_LS02_mat = data;
sess1_roi_timeseries = data.sess_roi_timeseries;
sess_roi_timeseries = [];
data.sess_roi_timeseries = [];
mean_LS02_mat.sess_roi_timeseries{1} = sess1_roi_timeseries;
mean_LS02_mat.sess_roi_timeseries = [];
mean_LS02_mat.sess_roi_timeseries{1} = sess1_roi_timeseries;
data = load(sprintf('%s/sub-%s/sub-%s_sess-%d_task-rest_corrmat_Seitzman300.mat',↙
datadir, 'LS02', 'LS02', 2));
sess2_roi_timeseries = data.sess_roi_timeseries;
mean_LS02_mat.sess_roi_timeseries{2} = sess2_roi_timeseries;
data_1 = load(sprintf('%s/sub-%s/sub-%s_sess-%d_task-rest_corrmat_Seitzman300.mat',↙
datadir, 'LS02', 'LS02', 1));
ses1_corrmat = data1.corrmat;
ses1_corrmat = data_1.corrmat;
ses2_corrmat = data.corrmat;
data_3 = load(sprintf('%s/sub-%s/sub-%s_sess-%d_task-rest_corrmat_Seitzman300.mat',↙
datadir, 'LS02', 'LS02', 3));
ses3_corrmat = data_3.corrmat;
mean_corrmat(1,:,:,:) = data1.corrmat;
mean_corrmat(1,:,:,:) = data_1.corrmat;
mean_corrmat(2,:,:,:) = data.corrmat;
mean_corrmat(3,:,:,:) = data_3.corrmat;
mean_corrmat = squeeze(mean(mean_corrmat));
sub-LS02_mean_corrmat = mean_corrmat;
LS02_mean_corrmat = mean_corrmat;
clear all
datadir = '/Users/dianaperez/Box/corrmats_Seitzman300/';
data = load(sprintf('%s/sub-%s/sub-%s_sess-%d_task-rest_corrmat_Seitzman300.mat',↙
datadir, subs{sub}, subs{sub}, ses));
data_1 = load(sprintf('%s/sub-%s/sub-%s_sess-%d_task-rest_corrmat_Seitzman300.mat',↙
datadir, 'LS03', 'LS03', 1));
data_2 = load(sprintf('%s/sub-%s/sub-%s_sess-%d_task-rest_corrmat_Seitzman300.mat',↙
datadir, 'LS03', 'LS03', 2));
data_3 = load(sprintf('%s/sub-%s/sub-%s_sess-%d_task-rest_corrmat_Seitzman300.mat',↙
datadir, 'LS03', 'LS03', 3));
data_4 = load(sprintf('%s/sub-%s/sub-%s_sess-%d_task-rest_corrmat_Seitzman300.mat',↙
datadir, 'LS03', 'LS03', 4));
data_5 = load(sprintf('%s/sub-%s/sub-%s_sess-%d_task-rest_corrmat_Seitzman300.mat',↙
datadir, 'LS03', 'LS03', 5));
mean_corrmat(1,:,:,:) = data_1.corrmat;
mean_corrmat(2,:,:,:) = data_2.corrmat;
mean_corrmat(3,:,:,:) = data_3.corrmat;
mean_corrmat(4,:,:,:) = data_4.corrmat;
mean_corrmat(5,:,:,:) = data_5.corrmat;
sub-LS03_mean_corrmat = squeeze(mean(mean_corrmat));
LS03_mean_corrmat = squeeze(mean(mean_corrmat));
clear data*
datadir = '/Users/dianaperez/Box/corrmats_Seitzman300/';
clear LS03_mean_corrmat mean_corrmat
data_1 = load(sprintf('%s/sub-%s/sub-%s_sess-%d_task-rest_corrmat_Seitzman300.mat',↙
datadir, 'LS05', 'LS05', 1));
data_2 = load(sprintf('%s/sub-%s/sub-%s_sess-%d_task-rest_corrmat_Seitzman300.mat',↙
datadir, 'LS05', 'LS05', 2));
data_3 = load(sprintf('%s/sub-%s/sub-%s_sess-%d_task-rest_corrmat_Seitzman300.mat',↙
datadir, 'LS05', 'LS05', 3));
data_4 = load(sprintf('%s/sub-%s/sub-%s_sess-%d_task-rest_corrmat_Seitzman300.mat',↙
```

```
datadir, 'LS05', 'LS05', 4));
data_5 = load(sprintf('%s/sub-%s/sub-%s_sess-%d_task-rest_corrmat_Seitzman300.mat',↙
datadir, 'LS05', 'LS05', 5));
mean_corrmat(1,:,:,:) = data_1.corrmat;
mean_corrmat(2,:,:,:) = data_2.corrmat;
mean_corrmat(3,:,:,:) = data_3.corrmat;
mean_corrmat(4,:,:,:) = data_4.corrmat;
mean_corrmat(5,:,:,:) = data_5.corrmat;
LS05_mean_corrmat = squeeze(mean(mean_corrmat));
clear mean_corrmat data_*
clear LS05_mean_corrmat
data_1 = load(sprintf('%s/sub-%s/sub-%s_sess-%d_task-rest_corrmat_Seitzman300.mat',↙
datadir, 'LS05', 'LS05', 1));
data_1 = load(sprintf('%s/sub-%s/sub-%s_sess-%d_task-rest_corrmat_Seitzman300.mat',↙
datadir, 'LS07', 'LS07', 1));
data_2 = load(sprintf('%s/sub-%s/sub-%s_sess-%d_task-rest_corrmat_Seitzman300.mat',↙
datadir, 'LS07', 'LS07', 2));
mean_corrmat(1,:,:,:) = data_1.corrmat;
mean_corrmat(2,:,:,:) = data_2.corrmat;
LS07_mean_corrmat = squeeze(mean(mean_corrmat));
atlas_dir = '/Users/dianaperez/Box/Dependencies/';
atlas_params = atlas_parameters_GrattonLab('Seitzman300',atlas_dir);
permute_flippedVars
fcimage_corrmat_volume
load('/Volumes/GRATTONLAB/HCP/Diana/HCP_variants/borderOrInsert.mat')
clear all
load('/Volumes/GRATTONLAB/HCP/Diana/HCP_variants/borderOrInsert.mat')
permute_flippedVars
load('net_clusters_left.mat')
load('net_clusters_right.mat')
load('cluster_info_left.mat')
load('cluster_info_right.mat')
varmap_1 = ft_read_cifti_mod↙
('/Volumes/GRATTONLAB/HCP/Variants/split/100206_uniqueIDs_afterReassign.dtseries.nii')
varmap_2 = ft_read_cifti_mod↙
('/Users/dianaperez/Desktop/Lateralization_thresh10/variantMaps_04282021/100206_Threshold↙
edVariantMap_SNRExclude_10.dtseries.nii');
corr(varmap_1.data, varmap_2.data)
find(varmap_1.data>0);
vars = find(varmap_1.data>0);
vars_2 = find(varmap_2.data>0);
varmap_1 = ft_read_cifti_mod↙
('/Volumes/GRATTONLAB/HCP/Variants/split/100206_uniqueIDs_afterReassign.dtseries.nii')
unique(varmap_1.data)
varmap_1 = ft_read_cifti_mod('/Volumes/GRATTONLAB/HCP/Variants/split/100206_reassigned.↙
dtseries.nii')
unique(varmap_1.data)
load('VariantsvsFlippedVariants_allSubs_true_spCorr_1000_thresh_10_permutations_2.mat')
load('VariantsvsFlippedVariants_allSubs_trueDiffMap_1000_thresh_10_permutations_2.mat')
permutations_cluster_correction
addpath(genpath('/Users/dianaperez/Box/Dependencies'))
permutations_cluster_correction
%-- 6/3/21, 12:23 PM --%
load↙
('/Users/dianaperez/Desktop/VariantsvsFlippedVariants_MSC_true_spCorr_1000_thresh_10_perm↙
utations_2.mat')
load↙
('/Users/dianaperez/Desktop/VariantsvsFlippedVariants_MSC_spCorr_1000_thresh_10_permutati↙
ons.mat')
figure
```

```
plot(1:1000, spCorrs, 'bo')
ylim([.1 1])
plot(500, true_spCorr, 'ro', 'MarkerFaceColor', 'r')
hold on
plot(1:1000, spCorrs, 'bo')
ylim([.1 1])
ylabel('r value');
xlabel('Permutations');
title(['Left Hem vs Pseudo Left Hem Variant Maps - MSC');
m = findobj(gca, 'Type', 'line');
hleg1 = legend(m(1:2), 'randomized maps', 'true map', 'Location', 'SouthWest');
hleg1.FontSize = 14;
ax = gca;
ax.FontSize = 14;
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.5, 0.7, 0.5, 0.7]);
print(gcf,↙
['/Users/dianaperez/Desktop/VariantsvsFlippedVariants_MSC_spCorr_10_thresh_1000_permutati↙
ons_results.jpg'],'-dpng','-r300');
close gcf
title(['Left Hem vs Pseudo Left Hem Variant Maps - MSC']);
ylabel('r value');
xlabel('Permutations');
title(['Left Hem vs Pseudo Left Hem Variant Maps - MSC']);
m = findobj(gca, 'Type', 'line');
hleg1 = legend(m(1:2), 'randomized maps', 'true map', 'Location', 'SouthWest');
hleg1.FontSize = 14;
ax = gca;
ax.FontSize = 14;
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.5, 0.7, 0.5, 0.7]);
print(gcf,↙
['/Users/dianaperez/Desktop/VariantsvsFlippedVariants_MSC_spCorr_10_thresh_1000_permutati↙
ons_results.jpg'],'-dpng','-r300');
close gcf
load('/Users/dianaperez/Desktop/varcount384split.mat')
load('/Users/dianaperez/Desktop/vertcount384split.mat')
left_cluster = var_count(3,:);
left_cluster = var_count(:,3);
right_cluster = var_count(:,4);
left_verts = vert_count(:,3);
right_verts = vert_count(:,4);
histogram(left_cluster)
hold on
histogram(right_cluster)
legend('Left Hem', 'Right Hem')
title('Variant Clusters by Hemisphere, 384 HCP subs split variants')
histogram(left_verts)
hold on
histogram(right_verts)
legend('Left Hem', 'Right Hem')
title('Variant Vertices by Hemisphere, 384 HCP subs split variants')
load('/Users/dianaperez/Desktop/varcountMSC.mat')
load('/Users/dianaperez/Desktop/vertcountMSC.mat')
left_cluster = var_count(1,:);
right_cluster = var_count(2,:);
left_vert = vert_count(1,:);
right_vert = vert_count(2,:);
histogram(left_cluster)
left_cluster = var_count(:,1);
right_cluster = var_count(:,2);
left_vert = vert_count(:,1);
```

```
right_vert = vert_count(:,2);
histogram(left_cluster)
hold on
histogram(right_cluster)
HCP_assignNetworksToVariants
load('goodSubs384.mat')
HCP_assignNetworksToVariants
addpath '/Users/dianaperez/Documents/GitHub/Lifespan-Analysis'
HCP_assignNetworksToVariants
%-- 6/14/21, 12:19 AM --%
load↙
('/Users/dianaperez/Desktop/384_original_variants/VariantsvsFlippedVariants_allSubs_true_↙
spCorr_1000_thresh_10_permutations_2.mat')
load↙
('/Users/dianaperez/Desktop/384_original_variants/VariantsvsFlippedVariants_allSubs_spCor↙
r_1000_thresh_10_permutations.mat')
plot(1:1000, spCorrs, 'bo')
y([.2 1])
ylim([.2 1])
hold on
plot(500, true_spCorr, 'ro', 'MarkerFaceColor', 'r')
HCP_assignNetworksToVariants
addpath '/Users/dianaperez/Documents/GitHub/Lifespan-Analysis'
HCP_assignNetworksToVariants
load('goodSubs384.mat')
find(subs==955465
find(subs==955465)
%-- 6/19/21, 11:05 AM --%
assignVars_HCP_dice
addpath '/Users/dianaperez/Documents/GitHub/Lifespan-Analysis'
assignVars_HCP_dice
addpath(genpath('/Users/dianaperez/Box/Dependencies/cifti-matlab-master/'))
assignVars_HCP_dice
read_nifti2_hdr
assignVars_HCP_dice
%-- 6/20/21, 10:43 PM --%
assignVars_HCP_dice
addpath '/Users/dianaperez/Box/Dependencies/cifti-matlab-master'
assignVars_HCP_dice
addpath '/Users/dianaperez/Documents/GitHub/Lifespan-Analysis'
assignVars_HCP_dice
%-- 6/21/21, 9:49 AM --%
assignVars_HCP_dice
%-- 6/21/21, 11:17 AM --%
assignVars_HCP_dice
addpath '/Users/dianaperez/Box/Dependencies/cifti-matlab-master'
assignVars_HCP_dice
addpath '/Users/dianaperez/Documents/GitHub/Lifespan-Analysis'
assignVars_HCP_dice
%-- 6/21/21, 3:44 PM --%
assignVars_HCP_dice
addpath '/Users/dianaperez/Documents/GitHub/Lifespan-Analysis'
assignVars_HCP_dice
load('/Users/dianaperez/Desktop/HCP384_split_WashUTemp_variants_info.mat')
load('/Users/dianaperez/Desktop/HCP384_split_WashUTemp_networksxHem.mat')
addpath(genpath('/Users/dianaperez/Box/Dependencies/cifti-matlab-master'))
addpath(genpath('/Users/dianaperez/Box/Research/Lateralization_Variants'))
dataLoc =↙
'/Users/dianaperez/Box/Research/Lateralization_thresh10/variantMaps_042821/reassigned/';↙
%location of variant maps
```

```
load('goodSubs384.mat')
subs = goodSubs384;
outfile = '/Users/dianaperez/Desktop/HCP_VANvariants_OverlapMap_384GoodSubs_split.↙
dtseries.nii';
for s = 1:subs
% load subject data
file = [dataLoc num2str(subs(s)) '_reassigned.dtseries.nii'];
cifti = ft_read_cifti_mod(file);
for q = 1:length(cifti.data)
if cifti.data(q) == 7
allsubs(q,s) = 1;
else
allsubs(q,s) = 0;
end
end
end
template = cifit;
groupsum = sum(allsubs,2);
disp(['The maximum number of subjects that overlap in the ' group ' group is ' num2str↙
(max(groupsum))])
groupmap = sum(allsubs,2)/nfiles;
disp(['The maximum proportion of subjects that overlap in the ' group ' group is '↙
num2str(max(groupmap))])
overlap_map = template;
overlap_map.data = groupmap;
ft_write_cifti_mod(outfile, overlap_map);
Overlap_VANvars
clear all
Overlap_VANvars
find(cifti.data==7)
sum(allsubs(:,6))
sum(find(cifti.data==7))
count(find(cifti.data==7))
find(cifti.data==7)
sum(allsubs(:,5))
template = cifti;
groupsum = sum(allsubs,2);
disp(['The maximum number of subjects that overlap in the ' group ' group is ' num2str↙
(max(groupsum))])
groupmap = sum(allsubs,2)/nfiles;
disp(['The maximum proportion of subjects that overlap in the ' group ' group is '↙
num2str(max(groupmap))])
overlap_map = template;
overlap_map.data = groupmap;
template = cifti;
groupsum = sum(allsubs,2);
disp(['The maximum number of subjects that overlap in the group is ' num2str(max↙
(groupsum))])
groupmap = sum(allsubs,2)/nfiles;
disp(['The maximum proportion of subjects that overlap in the group is ' num2str(max↙
(groupmap))])
overlap_map = template;
overlap_map.data = groupmap;
template = cifti;
groupsum = sum(allsubs,2);
disp(['The maximum number of subjects that overlap in the group is ' num2str(max↙
(groupsum))])
groupmap = sum(allsubs,2)/384;
disp(['The maximum proportion of subjects that overlap in the group is ' num2str(max↙
(groupmap))])
```

```
overlap_map = template;
overlap_map.data = groupmap;
ft_write_cifti_mod(outfile, overlap_map);
Overlap_VANvars
load('/Users/dianaperez/Desktop/HCP384_split_WashUTemp_variants_info.mat')
count(variants_info.left_hem.indiv_vars==3)
count(variants_info.left_hem.indiv_vars=3)
find(variants_info.left_hem.indiv_vars==3)
variants_info.left_hem.indiv_vars = sortrows(variants_info.left_hem.↙
indiv_vars,'network','ascend');
network = variants_info.left_hem.indiv_vars{929:1309,3};
%-- 6/23/21, 3:07 PM --%
load('HCP384_split_WashUTemp_variants_info.mat')
numVars = variants_info.left_hem.group_avg{:,1};
numVars_LH = numVars;
numVars1 = variants_info.right_hem.group_avg{:,1};
numVars_RH = numVars1;
clear numVars numVars1
hist(numVars_LH)
hold on
hist(numVars_RH)
close hist
close all
histogram(numVars_LH)
hold on
histogram(numVars_RH)
title('Number of Variant Clusters in Each Hemisphere')
ylabel(
ylabel('Number of Variants')
xlabel('Number of Subjects')
m = findobj(gca,'Type', 'line')
hleg1 = legend(m(1:2), 'Left Hem', 'Right Hem', 'Location', 'SouthWest');
legend( 'Left Hem', 'Right Hem', 'Location', 'SouthWest');
legend( 'Left Hem', 'Right Hem', 'Location', 'NorthEast');
ax = gca;
ax.FontSize = 14;
print(gcf, '/Users/dianaperez/Desktop/NumVarsxHem.jpg', '-dpng', '-r300');
clear ax m
clear numVars*
avgVarSize = variants_info.right_hem.group_avg{:,3};
avgVarSize_RH = avgVarSize;
clear avgVarSize
avgVarSize = variants_info.left_hem.group_avg{:,3};
avgVarSize_LH = avgVarSize;
clear avgVarSize
histogram(avgVarSize_LH)
close all
histogram(avgVarSize_LH)
hold on
histogram(avgVarSize_RH)
title('Average Variant Size in Each Hemisphere')
ylabel('Number of Vertices')
ylabel('Average Number of Vertices')
xlabel('Number of Subjects')
legend( 'Left Hem', 'Right Hem', 'Location', 'NorthEast');
ax = gca;
ax.FontSize = 14;
print(gcf, '/Users/dianaperez/Desktop/AvgVarSizexHem.jpg', '-dpng', '-r300');
[p_fdr, p_masked]= FDR([0.439504962 0.128675384 0.000274487 0.253014009 0.015014079], .↙
05);
```

```
clear ax avgVarSize* p*
numBorderVars = variants_info.left_hem.group_avg{:,4};
numBorderVars_LH = variants_info.left_hem.group_avg{:,4};
clear numBorderVars
numBorderVars_RH = variants_info.right_hem.group_avg{:,4};
histogram(numBorderVars_LH)
close all
histogram(numBorderVars_LH)
histogram(numBorderVars_RH)
histogram(numBorderVars_LH)
hold on
histogram(numBorderVars_RH)
title('Number of Border Variants in Each Hemisphere')
ylabel('Number of Variants')
xlabel('Number of Subjects')
legend( 'Left Hem', 'Right Hem', 'Location', 'NorthEast');
ax = gca;
ax.FontSize = 14;
print(gcf, '/Users/dianaperez/Desktop/BorderVarsxHem.jpg', '-dpng', '-r300');
clear numBorder* ax
numEctopicVars = variants_info.right_hem.group_avg{:,5};
numEctopicVars_RH = variants_info.right_hem.group_avg{:,5};
clear numEctopicVars
numEctopicVars_LH = variants_info.left_hem.group_avg{:,5};
histogram(numEctopicVars_LH)
hold on
histogram(numEctopicVars_RH)
title('Number of Ectopic Variants in Each Hemisphere')
ylabel('Number of Variants')
xlabel('Number of Subjects')
legend( 'Left Hem', 'Right Hem', 'Location', 'NorthEast');
ax = gca;
ax.FontSize = 14;
close all
histogram(numBorderVars_LH)
histogram(numEctopicVars_LH)
hold on
histogram(numEctopicVars_RH)
title('Number of Ectopic Variants in Each Hemisphere')
ylabel('Number of Variants')
xlabel('Number of Subjects')
legend( 'Left Hem', 'Right Hem', 'Location', 'NorthEast');
ax = gca;
ax.FontSize = 14;
print(gcf, '/Users/dianaperez/Desktop/EctopicVarsxHem.jpg', '-dpng', '-r300');
pvals = [0.000000011    0.121789080 0.000306024 0.086926523 0.000058774 0.468638463↙
0.029082589 0.234696159 0.094306337 0.041385242 1.000000000 0.622875291 0.879335992];
[p_fdr, p_masked]= FDR(pvals, .05);
load('HCP384_original_variants_info.mat')
clear ax num* p_* pvals
numVars = variants_info.left_hem.group_avg{1,1};
LH_numVars = variants_info.left_hem.group_avg{1,1};
RH_numVars = variants_info.right_hem.group_avg{1,1};
clear numVars
LH_numVars = variants_info.left_hem.group_avg{1,:};
LH_numVars = variants_info.left_hem.group_avg{:,1};
RH_numVars = variants_info.right_hem.group_avg{:,1};
histogram(LH_numVars)
close all
histogram(LH_numVars)
```

```
hold on
histogram(RH_numVars)
title('Number of Variants in Each Hemisphere')
ylabel('Number of Variant Clusters')
xlabel('Number of Subjects')
legend( 'Left Hem', 'Right Hem', 'Location', 'NorthEast');
ax = gca;
ax.FontSize = 14;
print(gcf, '/Users/dianaperez/Desktop/NumVarsxHem_384HCPog.jpg', '-dpng', '-r300');
avgVarSize = variants_info.left_hem.group_avg{:,3};
LH_avgVarSize = variants_info.left_hem.group_avg{:,3};
RH_avgVarSize = variants_info.right_hem.group_avg{:,3};
close all
histogram(LH_avgVarSize)
hold on
histogram(RH_avgVarSize)
title('Average Variant Size in Each Hemisphere')
ylabel('Number of Vertices')
xlabel('Number of Subjects')
legend( 'Left Hem', 'Right Hem', 'Location', 'NorthEast');
ax = gca;
ax.FontSize = 14;
xlabel('Number of Vertices')
ylabel('Number of Subjects')
print(gcf, '/Users/dianaperez/Desktop/AvgSizexHem_384HCPog.jpg', '-dpng', '-r300');
LH_numVars = variants_info.left_hem.group_avg{:,1};
RH_numVars = variants_info.right_hem.group_avg{:,1};
histogram(LH_numVars)
hold on
histogram(RH_numVars)
title('Number of Variants in Each Hemisphere')
xlabel('Number of Vertices')
ylabel('Number of Subjects')
legend( 'Left Hem', 'Right Hem', 'Location', 'NorthEast');
ax = gca;
ax.FontSize = 14;
close all
histogram(LH_numVars)
hold on
histogram(RH_numVars)
title('Number of Variants in Each Hemisphere')
xlabel('Number of Vertices')
ylabel('Number of Subjects')
legend( 'Left Hem', 'Right Hem', 'Location', 'NorthEast');
ax.FontSize = 14;
ax = gca;
ax.FontSize = 14;
print(gcf, '/Users/dianaperez/Desktop/NumVarsxHem_384HCPog.jpg', '-dpng', '-r300');
xlabel('Number of Variant Clusters')
print(gcf, '/Users/dianaperez/Desktop/NumVarsxHem_384HCPog.jpg', '-dpng', '-r300');
Overlap_VANvars
clear all
uiopen('/Users/dianaperez/Desktop/120_LR_minsize400_recolored_manualconsensus_LR.dlabel.↙
nii',1)
average = ft_read_cifti_mod↙
('/Users/dianaperez/Desktop/120_LR_minsize400_recolored_manualconsensus_LR.dlabel.nii');
find_former_networks
for net = 1:16
num_verts = length(find(allsubs==net));
disp(['Number of ' network_names{NOI} ' variant vertices that were formerly assigned to '↙
```

```
network_names{net} ' is: ' num2str(num_verts)]);
end
network_names{NOI}
assignVars_HCP_dice
sum = length(find(allsubs>0);
sum = length(find(allsubs>0));
network_names = {'DMN'  'Vis'   'FP'    'DAN'   'VAN'   'Sal'   'CO'    'SMd'   'SMl'↙
'Aud'   'Tpole' 'MTL'   'PMN'   'PON'};
old_nets = [];
for net = 1:16
num_verts = length(find(allsubs==net));
old_nets(1,net) = num_verts;
old_nets(1,net) = num_verts/sum;
disp(['Number of ' network_names{NOI} ' variant vertices that were formerly assigned to '↙
network_names{net} ' is: ' num2str(num_verts)]);
end
network_names = {'DMN'  'Vis'   'FP'    'Reward'    'Unassign'  'DAN'   'VAN'   'Sal'↙
'CO'    'SMd'   'SMl'   'Aud'   'Tpole' 'MTL'   'PMN'   'PON'};
old_nets = [];
for net = 1:16
num_verts = length(find(allsubs==net));
old_nets(1,net) = num_verts;
old_nets(1,net) = num_verts/sum;
disp(['Number of ' network_names{NOI} ' variant vertices that were formerly assigned to '↙
network_names{net} ' is: ' num2str(num_verts)]);
end
old_nets = [];
for net = 1:16
num_verts = length(find(allsubs==net));
old_nets(1,net) = num_verts;
old_nets(2,net) = num_verts/sum;
disp(['Number of ' network_names{NOI} ' variant vertices that were formerly assigned to '↙
network_names{net} ' is: ' num2str(num_verts)]);
end
VANvars_oldNets = old_nets;
find_former_networks
DMNvars_oldNets = old_nets;
find_former_networks
FPNvars_oldNets = old_nets;
pie(DMNvars_oldNets)
close all
pie(DMNvars_oldNets)
network_names = {'DMN'  'Vis'   'FP'    'Unassigned'    'DAN'   'Unassigned2'   'VAN'↙
'Sal'   'CO'    'SMd'   'SMl'   'Aud'   'Tpole' 'MTL'   'PMN'   'PON'   'Consensus'};↙
%% The colors that correspond to the Power functional networks in connectome workbench
rgb_colors = [1 0 0;    %% The colors that correspond to the Power functional networks in↙
MATLAB
0 0 .6;
1 1 0;
.67 .67 .67;
0 .8 0;
.67 .67 .67;
0 .6 .6;
0 0 0;
.3 0 .6;
.2 1 1;
1 .5 0;
.6 .2 1;
.2 1 .2;
0 .2 .4;
```

```
0 0 1;
.8 .8 .6;
.4 0 0];
networksexist = find(allsubs > 0);
network_legend = network_names(networksexist);
find_former_networks
networksexist = unique(find(allsubs > 0));
networksexist = unique(allsubs > 0);
networksexist = unique(allsubs);
networksexist = unique(allsubs);
networksexist = networksexits(2:end);
networksexist = networksexist(2:end);
network_legend = network_names(networksexist);
color_legend = rgb_colors(networksexist,:);
filename = [network_names{NOI} '_Variant_PieChart_Old_Networks.jpg'];
h = pie(old_nets(1,:);
h = pie(old_nets(1,:));
delete(findobj(h,'Type','text'))
for k = 1:length(h)/2
set(h(k*2-1), 'FaceColor', color_legend(k,:));
end
network_names = {'DMN'  'Vis'   'FP'    'Unassigned'    'DAN'   'Unassigned2'   'VAN'↙
'Sal'   'CO'    'SMd'   'SMl'   'Aud'   'Tpole' 'MTL'   'PMN'   'PON'};    %% The colors↙
that correspond to the Power functional networks in connectome workbench
rgb_colors = [1 0 0;    %% The colors that correspond to the Power functional networks in↙
MATLAB
0 0 .6;
1 1 0;
.67 .67 .67;
0 .8 0;
.67 .67 .67;
0 .6 .6;
0 0 0;
.3 0 .6;
.2 1 1;
1 .5 0;
.6 .2 1;
.2 1 .2;
0 .2 .4;
0 0 1;
.8 .8 .6];
for k = 1:length(h)/2
set(h(k*2-1), 'FaceColor', color_legend(k,:));
end
find_former_networks
h = pie(old_nets(1,networksexist));
print(gcf,['/Users/dianaperez/Desktop/' filename],'-dpng','-r300');
find_former_networks
permute_flippedVars
LH_files{1}
permute_flippedVars
permute_left_right_handers
min(spCorrs)
permutations_cluster_correction
%-- 6/29/21, 11:40 AM --%
permutations_cluster_correction
permutations_create_zmap
outfile = '/Users/dianaperez/Desktop/RightvsNonRightHanders_zmap.dtseries.nii';
ft_write_cifti_mod(outfile, template_cifti);
permute_left_right_handers
```

```
find(spCorrs<=true_spCorr)
4/1000
load↙
('/Users/dianaperez/Box/Research/Lateralization_thresh10/Permutation_Tests/PseudoRightvsP↙
seudoLHanders_spCorr_1000perms_thresh_10.mat')
load↙
('/Users/dianaperez/Box/Research/Lateralization_thresh10/Permutation_Tests/RightvsLeftHan↙
ders_true_spCorr_1000_thresh_10.mat')
find(spCorrs<=true_spCorr)
4/1000
load↙
('/Users/dianaperez/Box/Research/Lateralization_thresh10/Permutation_Tests/PseudoRightvsP↙
seudoNonRHanders_spCorr_1000perms_thresh_10.mat')
load↙
('/Users/dianaperez/Box/Research/Lateralization_thresh10/Permutation_Tests/RightvsnonRigh↙
tHanders_true_spCorr_1000_thresh_10.mat')
find(spCorrs<=true_spCorr)
1/1000
permutations_cluster_correction
permutations_create_zmap
load↙
('/Users/dianaperez/Box/Research/Lateralization_thresh10/Permutation_Tests/RightvsLeftHan↙
ders_true_RH-LH_diff_1000_thresh_10.mat')
clear all
load↙
('/Users/dianaperez/Box/Research/Lateralization_thresh10/Permutation_Tests/RightvsLeftHan↙
ders_true_RH-LH_diff_1000_thresh_10.mat')
template =↙
'/Volumes/GRATTONLAB/Lifespan/BIDS/Nifti/derivatives/postFCproc_CIFTI/dconn_cifti_normalw↙
all/sub-LS05_vs_120_allsubs_sptlCorr_cortex_smooth_2.55.dtseries.nii';
template.data = trueDiff;
template_cifti = ft_read_cifti_mod(template);
template_cifti.data = trueDiff;
ft_write_cifti_mod('/Users/dianaperez/Desktop/RH-LH_diffmap_HCP.dtseries.nii',↙
template_cifti);
load↙
('/Users/dianaperez/Box/Research/Lateralization_thresh10/Permutation_Tests/RightvsnonRigh↙
tHanders_true_RH-nonRH_diff_1000_thresh_10.mat')
template_cifti.data = trueDiff;
ft_write_cifti_mod('/Users/dianaperez/Desktop/RH-nonRH_diffmap_HCP.dtseries.nii',↙
template_cifti);
clear all
load('/Users/dianaperez/Desktop/HCP384_LH_split_networksxHem.mat')
load('/Users/dianaperez/Desktop/HCP384_LH_split_variants_info.mat')
networks_LH = networksxHem;
variants_LH = variants_info;
load('/Users/dianaperez/Desktop/HCP384_RH_split_networksxHem.mat')
load('/Users/dianaperez/Desktop/HCP384_RH_split_variants_info.mat')
networks_RH = networksxHem;
variants_RH = variants_info;
clear networksxHem variants_info
load('/Users/dianaperez/Desktop/HCP384_nonRH_split_networksxHem.mat')
load('/Users/dianaperez/Desktop/HCP384_nonRH_split_variants_info.mat')
test_mat = [];
for net = 1:16
end
count = 1;
for net = 1:16
test_mat(:,count) = networksxHem.clustersLH(net);
count = count + 1;
```

```
test_mat(:,count) = networksxHem.clustersRH(net);
count = count + 1;
end
for net = 1:16
test_mat(:,count) = networksxHem.clustersLH(:,net);
count = count + 1;
test_mat(:,count) = networksxHem.clustersRH(:,net);
count = count + 1;
end
test_mat(:,1) = networksxHem.clustersLH(:,1);
test_mat = [];
test_mat(:,1) = networksxHem.clustersLH(:,1);
test_mat = [];
for net = 1:16
test_mat(:,count) = networksxHem.clustersLH(:,net);
count = count + 1;
test_mat(:,count) = networksxHem.clustersRH(:,net);
count = count + 1;
end
for net = 1:16
test_mat(:,count) = networks_LH.clustersLH(:,net);
count = count + 1;
test_mat(:,count) = networks_LH.clustersRH(:,net);
count = count + 1;
end
test_mat = [];
for net = 1:16
test_mat(:,count) = networks_LH.clustersLH(:,net);
count = count + 1;
test_mat(:,count) = networks_LH.clustersRH(:,net);
count = count + 1;
end
test_mat = [];
for net = 1:16
test_mat(:,count) = networks_RH.clustersLH(:,net);
count = count + 1;
test_mat(:,count) = networks_RH.clustersRH(:,net);
count = count + 1;
end
test_mat = [];
for net = 1:16
test_mat(:,count) = networks_RH.clustersLH(:,net);
count = count + 1;
test_mat(:,count) = networks_RH.clustersRH(:,net);
count = count + 1;
end
test_mat = [];
count = 1;
for net = 1:16
test_mat(:,count) = networks_RH.clustersLH(:,net);
count = count + 1;
test_mat(:,count) = networks_RH.clustersRH(:,net);
count = count + 1;
end
test_mat = [];
count = 1;
for net = 1:16
test_mat(:,count) = networks_LH.clustersLH(:,net);
count = count + 1;
test_mat(:,count) = networks_LH.clustersRH(:,net);
```

```
count = count + 1;
end
test_mat = [];
count = 1;
for net = 1:16
test_mat(:,count) = networksxHem.clustersLH(:,net);
count = count + 1;
test_mat(:,count) = networksxHem.clustersRH(:,net);
count = count + 1;
end
test_mat = [];
count = 1;
for net = 1:16
test_mat(:,count) = networks_RH.clustersLH(:,net);
count = count + 1;
test_mat(:,count) = networks_RH.clustersRH(:,net);
count = count + 1;
end
[p_fdr, p_masked] = FDR([0.030170961
0.170336911
0.376937036
0.148030671
0.533538493
0.574763999
0.044798574
0.664306034
0.713950162
0.713950162
0.327715806
0.382384794], 0.05)
[p_fdr, p_masked] = FDR([0.00000008
0.44393710
0.00035698
0.12366324
0.00000741
0.57929040
0.01332763
0.19043900
0.10892350
0.06271794
1.00000000], 0.05
[p_fdr, p_masked] = FDR([0.00000008
0.44393710
0.00035698
0.12366324
0.00000741
0.57929040
0.01332763
0.19043900
0.10892350
0.06271794
1.00000000], 0.05)
load('/Users/dianaperez/HCP752_LH_og_networksxHem.mat')
load('/Users/dianaperez/HCP752_LH_og_variants_info.mat')
variants_LHand = variants_info;
networks_LHand = networksxHem;
clear all
networks_Lhand = load('/Users/dianaperez/HCP752_LH_og_networksxHem.mat')
load('/Users/dianaperez/HCP752_LH_og_networksxHem.mat')
clear all
```

```
load('/Users/dianaperez/HCP752_LH_og_networksxHem.mat')
load('/Users/dianaperez/HCP752_LH_og_variants_info.mat')
variants_Lhand = variants_info;
load('/Users/dianaperez/HCP752LH_og_variants_info.mat')
variants_Rhand = variants_info;
clear variants_info networksxHem
[p_fdr, p_masked] = FDR([0.00000001
0.12178908
0.00030602
0.08692652
0.00005877
0.46863846
0.02908259
0.23469616
0.09430634
0.04138524
1.00000000
0.62287529
0.87933599], 0.05)
[p_fdr, p_masked] = FDR([0.00000001
0.12178908
0.00030602
0.08692652
0.00005877
0.46863846
0.02908259
0.23469616
0.09430634
0.04138524
1.00000000
0.62287529
0.87933599], 0.01)
[p_fdr, p_masked] = FDR([0.022453292
0.966626019
0.03172435
0.035036299], 0.05)
clear all
ft_read_cifti
ft_read_cifti_mod↙
('/Users/dianaperez/Desktop/HCP_FPNvariants_OverlapMap_384GoodSubs_split.dtseries.nii');
FPN_overlap = ans.data;
ft_read_cifti_mod↙
('/Users/dianaperez/Desktop/HCP_VANvariants_OverlapMap_384GoodSubs_split.dtseries.nii');
VAN_overlap = ans.data;
ft_read_cifti_mod↙
('/Users/dianaperez/Desktop/HCP_DMNvariants_OverlapMap_384GoodSubs_split.dtseries.nii');
DMN_overlap = ans.data;
clear ans
cifti = ft_read_cifti_mod↙
('/Users/dianaperez/Desktop/HCP_FPNvariants_OverlapMap_384GoodSubs_split.dtseries.nii');
for i = 1:length(cifti.brainstructure)
if cifti.brainstructure(i) > 0
end
end
count = 1;
for i = 1:length(cifti.brainstructure)
if cifti.brainstructure(i) > 0
if VAN_overlap(count) > 0
new_cifti(i,1) = VAN_overlap(count);
else new_cifti(i,1) = 0;
```

```
end
count = count + 1;
else new_cifti(i,1) = 0;
end
end
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VAN_new = new_cifti;
count = 1;
or i = 1:length(cifti.brainstructure)
if cifti.brainstructure(i) > 0
new_cifti(i,1) = VAN_overlap(count);
count = count + 1;
else new_cifti(i,1) = 0;
end
end
for i = 1:length(cifti.brainstructure)
if cifti.brainstructure(i) > 0
new_cifti(i,1) = VAN_overlap(count);
count = count + 1;
else new_cifti(i,1) = 0;
end
end
corr(new_cifti, VAN_new)
clear new_cifti
count = 1;
for i = 1:length(cifti.brainstructure)
if cifti.brainstructure(i) > 0
DMN_new(i,1) = DMN_overlap(count);
count = count + 1;
else DMN_new(i,1) = 0;
end
end
count = 1;
for i = 1:length(cifti.brainstructure)
if cifti.brainstructure(i) > 0
FPN_new(i,1) = FPN_overlap(count);
count = count + 1;
else FPN_new(i,1) = 0;
end
end
left_DMN = DMN_new(1:32492);
left_FPN = FPN_new(1:32492);
left_VAN = VAN_new(1:32492);
right_DMN = DMN_new(32493:end);
right_FPN = FPN_new(32493:end);
right_VAN = VAN_new(32493:end);
flip_DMN = [right_DMN; left_DMN];
flip_FPN = [right_FPN; left_FPN];
flip_VAN = [right_VAN; left_VAN];
flip_DMN = flip_DMN(cifti.brainstructure>0);
flip_FPN = flip_FPN(cifti.brainstructure>0);
flip_VAN = flip_VAN(cifti.brainstructure>0);
diff_DMN = DMN_overlap - flip_DMN;
diff_FPN = FPN_overlap - flip_FPN;
diff_VAN = VAN_overlap - flip_VAN;
template = cifti;
template.data = diff_FPN;
ft_write_cifti_mod('/Users/dianaperez/Desktop/HCP_FPNvariants_diffMap_384GoodSubs_split.↙
dtseries.nii', template);
template.data = diff_DMN;
```

```
ft_write_cifti_mod('/Users/dianaperez/Desktop/HCP_DMNvariants_diffMap_384GoodSubs_split.↙
dtseries.nii', template);
template.data = diff_VAN;
ft_write_cifti_mod('/Users/dianaperez/Desktop/HCP_VANvariants_diffMap_384GoodSubs_split.↙
dtseries.nii', template);
clear all
CreateVariantFiles_LS03specific
load('/Users/dianaperez/Desktop/Thesis/HCP384_LH_split_variants_info.mat')
load('/Users/dianaperez/Desktop/Thesis/HCP384_original_variants_info.mat')
load('/Users/dianaperez/Desktop/Thesis/HCP752_LH_og_variants_info.mat')
load('/Users/dianaperez/Desktop/Thesis/HCP752_RH_og_variants_info.mat')
clear all
load('/Users/dianaperez/Desktop/Thesis/HCP752_LH_og_variants_info.mat')
load('/Users/dianaperez/Desktop/Thesis/HCP752_RH_og_variants_info.mat')
LH_info = load('/Users/dianaperez/Desktop/Thesis/HCP752_LH_og_variants_info.mat');
RH_info = load('/Users/dianaperez/Desktop/Thesis/HCP752_RH_og_variants_info.mat');
addpath(genpath('/Users/dianaperez/Box/Dependencies/cifti-matlab-master'));
rootDir = '/Users/dianaperez/Box/Research/Lateralization_Variants/';
%rootDir = '/projects/p31161/lateralizationVariants/';
addpath(genpath(rootDir))
outputDir = [rootDir 'Permutation_Tests/'];
%% VARIABLES
numperms = 1000;% number of permutations
spCorrs=zeros(numperms,1);% initialize mat of values i'm permuting
%% LOAD files
LH_info = load('/Users/dianaperez/Desktop/Thesis/HCP752_LH_og_variants_info.mat');
RH_info = load('/Users/dianaperez/Desktop/Thesis/HCP752_RH_og_variants_info.mat');
LH_variantSize = [LH_info.variant_info.left_hem.group_avg(:,3); LH_info.variant_info.↙
right_hem.group_avg(:,3)];
RH_variantSize = [RH_info.variant_info.left_hem.group_avg(:,3); RH_info.variant_info.↙
right_hem.group_avg(:,3)];
LH_numVars = [LH_info.variant_info.left_hem.group_avg(:,1); LH_info.variant_info.↙
right_hem.group_avg(:,1)];
RH_numVars = [RH_info.variant_info.left_hem.group_avg(:,1); RH_info.variant_info.↙
right_hem.group_avg(:,1)];
LH_variantSize = [LH_info.variants_info.left_hem.group_avg(:,3); LH_info.variants_info.↙
right_hem.group_avg(:,3)];
RH_variantSize = [RH_info.variants_info.left_hem.group_avg(:,3); RH_info.variants_info.↙
right_hem.group_avg(:,3)];
LH_numVars = [LH_info.variants_info.left_hem.group_avg(:,1); LH_info.variants_info.↙
right_hem.group_avg(:,1)];
RH_numVars = [RH_info.variants_info.left_hem.group_avg(:,1); RH_info.variants_info.↙
right_hem.group_avg(:,1)];
numSubs = length(LH_variantSize) + length(RH_variantSize);
numSubs = height(LH_variantSize) + height(RH_variantSize);
clear all
%% PATHS
%addpath(genpath('/projects/b1081/Scripts'));
addpath(genpath('/Users/dianaperez/Box/Dependencies/cifti-matlab-master'));
rootDir = '/Users/dianaperez/Box/Research/Lateralization_Variants/';
%rootDir = '/projects/p31161/lateralizationVariants/';
addpath(genpath(rootDir))
outputDir = [rootDir 'Permutation_Tests/'];
%% VARIABLES
numperms = 1000;% number of permutations
spCorrs=zeros(numperms,1);% initialize mat of values i'm permuting
%% LOAD files
LH_info = load('/Users/dianaperez/Desktop/Thesis/HCP752_LH_og_variants_info.mat');
RH_info = load('/Users/dianaperez/Desktop/Thesis/HCP752_RH_og_variants_info.mat');
LH_variantSize = [LH_info.variants_info.left_hem.group_avg(:,3); LH_info.variants_info.↙
```

```
right_hem.group_avg(:,3)];
RH_variantSize = [RH_info.variants_info.left_hem.group_avg(:,3); RH_info.variants_info.↙
right_hem.group_avg(:,3)];
LH_numVars = [LH_info.variants_info.left_hem.group_avg(:,1); LH_info.variants_info.↙
right_hem.group_avg(:,1)];
RH_numVars = [RH_info.variants_info.left_hem.group_avg(:,1); RH_info.variants_info.↙
right_hem.group_avg(:,1)];
numSubs = length(LH_variantSize) + length(RH_variantSize);
help dir
cd /Users/dianaperez/Box
dir('105216_rfMRI_REST2_RL')
L = dir('105216_rfMRI_REST2_RL')
clear all
cd /Users/dianaperez/Box/DATA/
bold_dir = dir('BOLD_DATA');
for dir = 1:length(bold_dir)
dir_files = dir(bold_dir.name(dir));
end
end
dir('105216_rfMRI_REST2_RL')
clear dir
dir('105216_rfMRI_REST2_RL')
d = dir('105216_rfMRI_REST2_RL')
bytes = [d.bytes].';
sum(bytes)
size_in_gig = ans/1000000000
clear all
cd /Users/dianaperez/Box/DATA/
bold_dir = dir('BOLD_DATA');
data_info = [];
count = 1;
d = 1'
dir_files = dir(bold_dir.name(d));
%% folder
data_info(count,1) = bold_dir.name(d);
%% number of files
data_info(count,2) = length(dir_files);
%% size
bytes = [dir_files.bytes].';
size_in_bytes = sum(bytes);
size_in_gigs = size_in_bytes/1000000000;
data_info(count,3) = size_in_gigs;
count = count + 1;
find_missing_HCPdata
bold_dir = bold_dir(3:end);
for i=1:4072
end
data_info = cell(4072,2);
for i=1:4072
thisDir = dir(['/Users/dianaperez/Box/DATA/BOLD_DATA/' bold_dir(i).name]);
data_info(i,1) - bold_dir(i).name;
sizes = ([thisDir.bytes].')./1000000000;
folder_sizes(i,2)=sum(sizes);
end
data_info = cell(4072,2);
for i=1:4072
thisDir = dir(['/Users/dianaperez/Box/DATA/BOLD_DATA/' bold_dir(i).name]);
data_info(i,1) = bold_dir(i).name;
sizes = ([thisDir.bytes].')./1000000000;
data_info(i,2)=sum(sizes);
```

```
end
for i=1:4072
thisDir = dir(['/Users/dianaperez/Box/DATA/BOLD_DATA/' bold_dir(i).name]);
data_info{i,1} = bold_dir(i).name;
sizes = ([thisDir.bytes].')./1000000000;
data_info{i,2}=sum(sizes);
end
clear bold_dir count d i sizes thisDir
load('/Users/dianaperez/Downloads/BOLD_DATA_folder_sizes.mat')
folder_match = cell(4072,1);
for i = 1:4072
if data_info(i,2) == folder_sizes(i,2)
folder_match(i,1) == 0
else
folder_match(i,1) == 1
end
end
for i = 1:4072
if data_info{i,2} == folder_sizes{i,2}
folder_match{i,1} == 0
else
folder_match{i,1} == 1
end
end
folder_match = [];
for i = 1:4072
if data_info{i,2} == folder_sizes{i,2}
folder_match(i,1) == 0
else
folder_match(i,1) == 1
end
end
for i = 1:4072
if data_info{i,2} == folder_sizes{i,2}
folder_match(i) == 0
else
folder_match(i) == 1
end
end
if data_info{1,2} == folder_sizes{1,2}
disp('they match')
end
find_missing_HCPdata
folder_match = folder_match';
find(folder_match==1)
data_info(1679)
data_info(3043)
data_info(3435)
data_info(1679,2 - folder_sizes{1672,2}
data_info{1679,2} - folder_sizes{1672,2}
data_info{3435,2} - folder_sizes{3435,2}
data_info{3043,2} - folder_sizes{3043,2}
clear all
load('/Users/dianaperez/Desktop/Thesis/HCP752_LH_og_variants_info.mat')
load('/Users/dianaperez/Desktop/Thesis/HCP752_RH_og_variants_info.mat')
permute_varSize
avgVarSize = LH_varSize{1,1};
permute_varSize
help interp1
permute_varSize
```

```
plot(1:1000, perm_corrs(:,1), 'bo', 'MarkerFaceColor', 'b')
hold on
plot(500, LHand_varSize_trueCorr, 'ro', 'MarkerFaceColor', 'r')
h = length(find(perm_corrs(:,1)<LHand_varSize_trueCorr))
h = length(find(perm_corrs(:,2)<RHand_varSize_trueCorr))
h = length(find(perm_corrs(:,2)<Rhand_varSize_trueCorr))
close gcf
plot(1:1000, perm_corrs(:,2), 'bo', 'MarkerFaceColor', 'b')
plot(500, Rhand_varSize_trueCorr, 'ro', 'MarkerFaceColor', 'r')
hold on
plot(1:1000, perm_corrs(:,2), 'bo', 'MarkerFaceColor', 'b')
close gcf
h = length(find(perm_corrs(:,3)<LHand_numVars_trueCorr))
h = length(find(perm_corrs(:,4)<RHand_numVars_trueCorr))
h = length(find(perm_corrs(:,4)<Rhand_numVars_trueCorr))
%-- 7/22/21, 12:32 PM --%
permute_varSize
length(find(perm_corrs(:,1)<LHand_varSize_trueCorr))/1000
disp(['P value for LHand varSize comparison is ' length(find(perm_corrs(:,1)↙
<LHand_varSize_trueCorr))/1000])
disp(['P value for RHand varSize comparison is ' length(find(perm_corrs(:,2)↙
<RHand_varSize_trueCorr))/1000])
disp(['P value for LHand numVars comparison is ' length(find(perm_corrs(:,3)↙
<LHand_numVars_trueCorr))/1000])
disp(['P value for RHand numVars comparison is ' length(find(perm_corrs(:,4)↙
<Rhand_numVars_trueCorr))/1000])
disp(['P value for LHand varSize diff comparison is ' length(find(perm_corrs(:,5)↙
<LHand_varSize_diff))/1000])
disp(['P value for RHand varSize diff comparison is ' length(find(perm_corrs(:,6)↙
<RHand_varSize_diff))/1000])
disp(['P value for LHand numVars diff comparison is ' length(find(perm_corrs(:,7)↙
<LHand_numVars_diff))/1000])
disp(['P value for RHand numVars diff comparison is ' length(find(perm_corrs(:,8)↙
<RHand_numVars_diff))/1000])
disp(['P value for LHand varSize comparison is ' length(find(perm_corrs(:,1)↙
<LHand_varSize_trueCorr))/1000])
disp(['P value for RHand varSize comparison is ' length(find(perm_corrs(:,2)↙
<Rhand_varSize_trueCorr))/1000])
disp(['P value for LHand numVars comparison is ' length(find(perm_corrs(:,3)↙
<LHand_numVars_trueCorr))/1000])
disp(['P value for RHand numVars comparison is ' length(find(perm_corrs(:,4)↙
<Rhand_numVars_trueCorr))/1000])
disp(['P value for LHand varSize diff comparison is ' length(find(perm_corrs(:,5)↙
<LHand_varSize_diff))/1000])
disp(['P value for RHand varSize diff comparison is ' length(find(perm_corrs(:,6)↙
<RHand_varSize_diff))/1000])
disp(['P value for LHand numVars diff comparison is ' length(find(perm_corrs(:,7)↙
<LHand_numVars_diff))/1000])
disp(['P value for RHand numVars diff comparison is ' length(find(perm_corrs(:,8)↙
<RHand_numVars_diff))/1000])
disp(['P value for LHand varSize comparison is ' num2str(length(find(perm_corrs(:,1)↙
<LHand_varSize_trueCorr))/1000)])
disp(['P value for RHand varSize comparison is ' num2str(length(find(perm_corrs(:,2)↙
<Rhand_varSize_trueCorr))/1000)])
disp(['P value for LHand numVars comparison is ' num2str(length(find(perm_corrs(:,3)↙
<LHand_numVars_trueCorr))/1000)])
disp(['P value for RHand numVars comparison is ' num2str(length(find(perm_corrs(:,4)↙
<Rhand_numVars_trueCorr))/1000)])
disp(['P value for LHand varSize diff comparison is ' num2str(length(find(perm_corrs(:,5)↙
<LHand_varSize_diff))/1000)])
```

```
disp(['P value for RHand varSize diff comparison is ' num2str(length(find(perm_corrs(:,6)↙
<RHand_varSize_diff))/1000)])
disp(['P value for LHand varSize comparison is ' num2str(length(find(perm_corrs(:,1)↙
<LHand_varSize_trueCorr))/1000)])
disp(['P value for RHand varSize comparison is ' num2str(length(find(perm_corrs(:,2)↙
<Rhand_varSize_trueCorr))/1000)])
disp(['P value for LHand numVars comparison is ' num2str(length(find(perm_corrs(:,3)↙
<LHand_numVars_trueCorr))/1000)])
disp(['P value for RHand numVars comparison is ' num2str(length(find(perm_corrs(:,4)↙
<Rhand_numVars_trueCorr))/1000)])
disp(['average corr value for LHand varSize diff comparison is ' num2str(mean(perm_corrs↙
(:,5)))])
disp(['average corr value for RHand varSize diff comparison is ' num2str(mean(perm_corrs↙
(:,6)))])
disp(['average corr value for LHand numVars diff comparison is ' num2str(mean(perm_corrs↙
(:,7)))])
disp(['average corr value for RHand numVars diff comparison is ' num2str(mean(perm_corrs↙
(:,8)))])
permute_varSize
numVars = LH_info.variants_info.both_hems{:,1};
permute_varSize
help datasample
permute_varSize
disp(['P value for varSize comparison is ' num2str(length(find(perm_corrs(:,1)↙
<avg_varSize_trueCorr))/1000)])
disp(['P value for varSizeDiff comparison is ' num2str(length(find(perm_corrs(:,4)↙
<avg_varSizeDiff_trueCorr))/1000)])
disp(['P value for numVarsDiff comparison is ' num2str(length(find(perm_corrs(:,3)↙
<avg_numVarsDiff_trueCorr))/1000)])
length(find(perm_corrs(:,3)<avg_numVarsDiff_trueCorr))
permute_varSize
%-- 7/28/21, 1:45 PM --%
load('/Users/dianaperez/Desktop/HCP384_original_variants_info.mat')
clear all
allSubs_info = load('/Users/dianaperez/Desktop/HCP384_original_variants_info.mat');
numVars = allSubs_info.variants_info.left_hem.group_avg{:,1};
clear numVars
left_hem = allSubs_info.variants_info.left_hem.group_avg{:,1};
right_hem = allSubs_info.variants_info.right_hem.group_avg{:,1};
diff = left_hem-right_hem;
mean_diff = mean(left_hem - right_hem);
help mean
permute_varSize
disp(['Below: ' num2str(length(find(perm_diff<true_diff))/1000)])
disp(['Above: ' num2str(length(find(perm_diff>true_diff))/1000)])
permute_varSize
left_hand_diff = mean(left_hand_left_hem(:,:) - left_hand_right_hem(:,:));
permute_varSize
left_hand_left_hem = LHand_info.variants_info.left_hem.group_avg{:,1};
left_hand_right_hem = LHand_info.variants_info.right_hem.group_avg{:,1};
left_hand_diffs = left_hand_left_hem - left_hand_right_hem;
true_diff_left_hand = mean(left_hand_diffs);
right_hand_left_hem = RHand_info.variants_info.left_hem.group_avg{:,1};
right_hand_right_hem = RHand_info.variants_info.right_hem.group_avg{:,1};
right_hand_diffs = right_hand_left_hem - right_hand_right_hem;
true_diff_right_hand = mean(right_hand_diffs);
true_diff = true_diff_left_hand - true_diff_right_hand;
num_vars_diff = [left_hand_diffs; right_hand_diffs];
numSubs = 699;
flip_switch = zeros(numSubs,1);
```

```
flip_switch(1:651) = 1;
for p = 1:numperms
rng('shuffle');
ind = randperm(length(flip_switch))';
for s = 1:length(flip_switch)
rand_flip_switch(s,1) = flip_switch(ind(s));
end
pseudo_left_handers = num_vars_diff(rand_flip_switch==0);
pseudo_right_handers = num_vars_diff(rand_flip_switch==1);
perm_diffs(p,1) = mean(pseudo_left_handers) - mean(pseudo_right_handers);
end
disp(['Hemisphere X Handedness, Number of Variants (permute handedness) - Below: '↙
num2str(length(find(perm_diffs<true_diff))/1000)])
disp(['Hemisphere X Handedness, Number of Variants (permute handedness) - Above: '↙
num2str(length(find(perm_diffs>true_diff))/1000)])
clear perm_diffs
left_hand_left_hem = LHand_info.variants_info.left_hem.group_avg{:,1};
left_hand_right_hem = LHand_info.variants_info.right_hem.group_avg{:,1};
left_hand_diffs = left_hand_left_hem - left_hand_right_hem;
true_diff_left_hand = mean(left_hand_diffs);
right_hand_left_hem = RHand_info.variants_info.left_hem.group_avg{:,1};
right_hand_right_hem = RHand_info.variants_info.right_hem.group_avg{:,1};
right_hand_diffs = right_hand_left_hem - right_hand_right_hem;
true_diff_right_hand = mean(right_hand_diffs);
true_diff = true_diff_left_hand - true_diff_right_hand;
num_vars_diff = [left_hand_diffs; right_hand_diffs];
numSubs = 699;
flip_switch = zeros(numSubs,1);
flip_switch(1:651) = 1;
for p = 1:numperms
rng('shuffle');
ind = randperm(length(flip_switch))';
for s = 1:length(flip_switch)
rand_flip_switch(s,1) = flip_switch(ind(s));
end
pseudo_left_handers = num_vars_diff(rand_flip_switch==0);
pseudo_right_handers = num_vars_diff(rand_flip_switch==1);
perm_diffs(p,1) = mean(pseudo_left_handers) - mean(pseudo_right_handers);
end
disp(['Hemisphere X Handedness, Number of Variants (permute handedness) - Below: '↙
num2str(length(find(perm_diffs<true_diff))/1000)])
disp(['Hemisphere X Handedness, Number of Variants (permute handedness) - Above: '↙
num2str(length(find(perm_diffs>true_diff))/1000)])
permute_varSize
rng('shuffle');
ind = randperm(length(flip_switch))';
rand_flip_switch = flip_switch(ind)
%-- 7/29/21, 2:28 PM --%
permute_varSize
%-- 8/6/21, 3:50 PM --%
crossRefHCP
goodSubs_col = cell2mat(goodSubs(1:752,2));
dem_info_752 = [goodSubs_all(:,1) goodSubs_all(:,2) goodSubs_all(:,12)];
crossRefHCP
%-- 8/14/21, 3:44 PM --%
crossRefHCP
goodSubs_col = cell2mat(goodSubs(1:384,1));
crossRefHCP
clear all
load('/Users/dianaperez/Desktop/384_demog_info.mat')
```

```
goodSubs384 = dem_info;
load('/Users/dianaperez/Desktop/752_demog_info.mat')
goodSubs752 = dem_info;
length(find(goodSubs384=='M')
length(find(goodSubs384=='M'))
length(find(goodSubs384='M'))
length(find(goodSubs384(:,3)='M'))
length(find(goodSubs384(:,3)=='M'))
384-210
mean(goodSubs384(:,2))
crossRefHCP
%-- 8/15/21, 3:41 PM --%
assignVars_HCP_dice
%-- 8/16/21, 9:10 PM --%
load('/Users/dianaperez/Desktop/HCP384_new_split_variants_info.mat')
y = variants_info.left_hem.group_avg(:,1);
x = variants_info.right_hem.group_avg(:,1);
[h,p,stats] = ttest(x,y);
numVars = variants_info.left_hem.group_avg{:,1};
numVars_left = variants_info.left_hem.group_avg{:,1};
numVars_right = variants_info.right_hem.group_avg{:,1};
[h,p,stats] = ttest(numVars_left,numVars_right);
[h,p,stats] = ttest(numVars_right,numVars_left);
varSize_left = variants_info.left_hem.group_avg{:,3};
varSize_right = variants_info.right_hem.group_avg{:,3};
[h,p,ci,stats] = ttest(varSize_left,varSize_right);
mean(varSize_left)
mean(varSize_right)
load('/Users/dianaperez/Desktop/Thesis/HCP384_original_variants_info.mat')
numVars_left = variants_info.left_hem.group_avg{:,1};
numVars_right = variants_info.right_hem.group_avg{:,1};
[h,p,ci,stats] = ttest(numVars_left,numVars_right);
mean(numVars_left)
mean(numVars_right)
varSize_left = variants_info.left_hem.group_avg{:,3};
varSize_right = variants_info.right_hem.group_avg{:,3};
[h,p,ci,stats] = ttest(varSize_left,varSize_right);
mean(varSize_left)
mean(varSize_right)
load('/Users/dianaperez/Desktop/HCP384_new_split_variants_info.mat')
varSize_left = variants_info.left_hem.group_avg{:,3};
varSize_right = variants_info.right_hem.group_avg{:,3};
[h,p,ci,stats] = ttest(varSize_left,varSize_right);
mean(varSize_left)
mean(varSize_right)
numVars_left = variants_info.left_hem.group_avg{:,1};
numVars_right = variants_info.right_hem.group_avg{:,1};
[h,p,ci,stats] = ttest(numVars_left,numVars_right);
mean(numVars_left)
mean(numVars_right)
histogram(numVars_left)
hold on
histogram(numVars_right)
title('Number of variant clusters')
xlabel('Number of clusters')
ylabel('Frequency')
ylabel('Frequency (number of subjects)')
legend('Left Hemisphere', 'Right Hemisphere')
ax = gca;
ax.FontSize = 14;
```

```
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0, 30, 0, `00]);
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0, 30, 0, 100]);
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.5, 0.7, 0.5, 0.7]);
print(gcf, '/Users/dianaperez/Desktop/HCP_new_split_vars_numVars.jpg', '-dpng', '-r300')
close gcf
histogram(varSize_left)
hold on
histogram(varSize_right)
title('Average variant size')
xlabel('Variant size in vertices')
ylabel('Frequency (number of subjects')
legend('Left Hemisphere', 'Right Hemisphere')
ax = gca;
ax.FontSize = 14;
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.5, 0.7, 0.5, 0.7]);
print(gcf, '/Users/dianaperez/Desktop/HCP_new_split_vars_varSize.jpg', '-dpng', '-r300')
close gcf
load↙
('/Users/dianaperez/Box/Research/Lateralization_thresh10/subjectData/goodSubs_addtlinfo.↙
mat')
load('/Users/dianaperez/Desktop/Thesis/HCP384_split_WashUTemp_networksxHem.mat')
HCP_goodSubs1 = HCP_goodSubs1(2:end);
HCP_goodSubs1 = HCP_goodSubs1{1:end};
lang = HCP_goodSubs{2:end,5};
lang = HCP_goodSubs{2:385,5};
lang_measures = HCP_goodSubs
clear all
load↙
('/Users/dianaperez/Box/Research/Lateralization_thresh10/subjectData/goodSubs_addtlinfo.↙
mat')
load('/Users/dianaperez/Desktop/Thesis/HCP384_split_WashUTemp_networksxHem.mat')
lang_overall = cell2mat(HCP_goodSubs(2:end,5));
subs = cell2mat(HCP_goodSubs(2:end,1));
lang_scores = [subs; lang_overall];
lang_scores = [subs lang_overall];
clear lang_overall subs
load('/Users/dianaperez/Box/Research/Lateralization_thresh10/subjectData/goodSubs384.↙
mat')
VAN_left = clustersLH;
VAN_right = clustersRH;
diff = VAN_left-VAN_right;
VAN_diff = [goodSubs384(:,1) diff];
VAN_diff = [VAN_diff lang_scores(:,2)];
corr(VAN_diff(:,2), VAN_diff(:,3))
corrcoef(VAN_diff(:,2), VAN_diff(:,3))
R = corrcoef(VAN_diff(:,2), VAN_diff(:,3))
rsq = R(2,1)^2
plot(VAN_diff(:,2), VAN_diff(:,3))
R = corrcoef(VAN_diff1, VAN_diff2)
rsq = R(2,1)^2
plot(VAN_diff(:,2), VAN_diff(:,3))
plot(VAN_diff1, VAN_diff2)
R = corrcoef(VAN_diff3, VAN_diff2)
rsq = R(2,1)^2
plot(VAN_diff3, VAN_diff2)
scatter(VAN_diff3, VAN_diff2)
find(VAN_diff3==NaN)
find(VAN_diff2==NaN)
R = corrcoef(VAN_diff3, VAN_diff2)
rsq = R(2,1)^2
```

```
lang_VANdiff = VAN_diff;
title('Linear Regression: Language scores and # of VAN Variants (left - right)')
xlabel('language overall accuracy')
ylabel('# of VAN variants difference (left hem - right hem)')
VANdiff_hand = [goodSubs384 VAN_diff1];
R = corrcoef(VANdiff_hand(:,2), VANdiff_hand(:,3))
rsq = R(2,1)^2
R = corrcoef(lang_VANdiff(:,2), lang_VANdiff(:,4));
rsq = R(2,1)^2
load('/Users/dianaperez/Desktop/HCP384_new_split_variants_info.mat')
load('/Users/dianaperez/Box/Research/Lateralization_thresh10/subjectData/goodSubs384.↙
mat')
clear goodSubs384
load('/Users/dianaperez/Box/Research/Lateralization_thresh10/subjectData/goodSubs384.↙
mat')
numVars_diff = variants_info.left_hem.group_avg(:,1)-variants_info.right_hem.group_avg(:,↙
1);
numVars = variants_info.left_hem.group_avg{1,1};
numVars1 = variants_info.left_hem.group_avg{:,1};
clear numVars
numVars = variants_info.right_hem.group_avg{:,1};
numVars_diff = numVars1 - numVars;
R = corrcoef(goodSubs384(:,2), goodSubs384(:,3))
rsq = R(2,1)^2
scatter(goodSubs384(:,2), goodSubs384(:,3))
clear all
load('/Users/dianaperez/Desktop/HCP384_new_split_networksxHem.mat')
load('/Users/dianaperez/Desktop/HCP384_new_split_variants_info.mat')
numVars = variants_info.left_hem.group_avg{:,1};
left_numVars = numVars;
right_numVars = variants_info.right_hem.group_avg{:,1};
clear numVars
right_varSize = variants_info.right_hem.group_avg{:,3};
left_varSize = variants_info.left_hem.group_avg{:,3};
histogram(left_numVars)
hold on
histogram(right_numVars)
[p t ci stats] = ttest(left_numVars,right_numVars);
title('Number of Variants Across Hemispheres')
xlabel('
xlabel('Number of Clusters')
ylabel('Frequency (Number of Subjects)')
legend('Left Hemisphere', 'Right Hemisphere')
ax = gca;
ax.FontSize = 14;
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.5, 0.7, 0.5, 0.7]);
print(gcf,[outputDir outputName '.jpg'],'-dpng','-r300');
print(gcf,'/Users/dianaperez/Desktop/numVars_384subs_newsplitvars.jpg'],'-dpng','-r300');
print(gcf,'/Users/dianaperez/Desktop/numVars_384subs_newsplitvars.jpg','-dpng','-r300');
close gcf
histogram(left_varSize)
hold on
histogram(right_varSize)
[sig p ci stats] = ttest(left_numVars,right_numVars);
[sig p ci stats] = ttest(left_varSize,right_varSize);
xlabel('Variant Size (Number of Vertices)')
ylabel('Frequency (Number of Subjects)')
ax = gca;
ax.FontSize = 14;
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.5, 0.7, 0.5, 0.7]);
```

```
legend('Left Hemisphere', 'Right Hemisphere')
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.5, 0.7, 0.5, 0.7]);
ax.FontSize = 14;
title('Average Variant Size Across Hemispheres')
ax = gca;
ax.FontSize = 14;
print(gcf,'/Users/dianaperez/Desktop/varSize_384subs_newsplitvars.jpg','-dpng','-r300');
close gcf
left_hemi = networksxHem.clustersLH{:,2};
left_hemi = networksxHem.clustersLH(:,2);
network_names = {'DMN'  'Vis'   'FP'    'Unassigned'    'DAN'   'Unassigned2'   'VAN'↙
'Sal'   'CO'    'SMd'   'SMl'   'Aud'   'Tpole' 'MTL'   'PMN'   'PON'};
wb_colors = [1 2 3 5 7 8 9 10 11 12 13 14 15 16];
results = [];
statistics = [];
for net = 1:numel(network_names)
left_hemi = networksxHem.clustersLH(:,net);
right_hemi = networksxHem.clustersRH(:,net);
results(net,1) = networks_names{net};
results(net,2) = mean(left_hemi);
results(net,3) = mean(right_hemi);
[sig p ci stats] = ttest(left_hemi, right_hemi);
results(net,4) = p;
statistics{net} = stats;
end
network_names = {'DMN'  'Vis'   'FP'    'Unassigned'    'DAN'   'Unassigned2'   'VAN'↙
'Sal'   'CO'    'SMd'   'SMl'   'Aud'   'Tpole' 'MTL'   'PMN'   'PON'};
wb_colors = [1 2 3 5 7 8 9 10 11 12 13 14 15 16];
results = [];
statistics = [];
for net = 1:numel(network_names)
left_hemi = networksxHem.clustersLH(:,net);
right_hemi = networksxHem.clustersRH(:,net);
results(net,1) = network_names{net};
results(net,2) = mean(left_hemi);
results(net,3) = mean(right_hemi);
[sig p ci stats] = ttest(left_hemi, right_hemi);
results(net,4) = p;
statistics{net} = stats;
end
results(1,1) = network_names{net}
results(1,1) = network_names{1}
results(1,1) = network_names(1)
results(1,1) = network_names(1,1)
results(1,1) = network_names{1,1}
results{1,1} = network_names{1,1}
for net = 1:numel(network_names)
left_hemi = networksxHem.clustersLH(:,net);
right_hemi = networksxHem.clustersRH(:,net);
results(net,1) = mean(left_hemi);
results(net,2) = mean(right_hemi);
[sig p ci stats] = ttest(left_hemi, right_hemi);
results(net,3) = p;
statistics{net} = stats;
end
for net = 1:numel(network_names)
left_hemi = networksxHem.clustersLH(:,net);
right_hemi = networksxHem.clustersRH(:,net);
results(net,1) = mean(left_hemi);
results(net,2) = mean(right_hemi);
```

```
[sig p ci stats] = ttest(left_hemi, right_hemi);
results(net,3) = p;
statistics(net) = stats;
end
results = [];
statistics = [];
for net = 1:numel(network_names)
left_hemi = networksxHem.clustersLH(:,net);
right_hemi = networksxHem.clustersRH(:,net);
results(net,1) = mean(left_hemi);
results(net,2) = mean(right_hemi);
[sig p ci stats] = ttest(left_hemi, right_hemi);
results(net,3) = p;
statistics{net} = stats;
end
results = [];
statistics = [];
for net = 1:numel(network_names)
left_hemi = networksxHem.clustersLH(:,net);
right_hemi = networksxHem.clustersRH(:,net);
results(net,1) = mean(left_hemi);
results(net,2) = mean(right_hemi);
[sig p ci stats] = ttest(left_hemi, right_hemi);
results(net,3) = sig;
results(net,4) = p;
statistics{net} = stats;
end
[p_fdr, p_masked] = FDR(results(:,4), .05)
find(p_masked==1);
[p_fdr, results(:,5)] = FDR(results(:,4), .05)
bar(1:16, results(:,1:2))
legend('Left Hem', 'Right Hem')
ax = gca;
XTick(network_names)
xticks(network_names)
xtickslabels(network_names)
xticklabels(network_names)
network_names = {'DMN'  'Vis'   'FP'    ' ' 'DAN'   ' ' 'VAN'   'Sal'   'CO'    'SMd'↙
'SMl'   'Aud'   'Tpole' 'MTL'   'PMN'   'PON'};
xticklabels(network_names)
/Volumes/fsmresfiles/PBS/Gratton_Lab/Lifespan/Post-↙
COVID/BIDS/DICOMS/LS08_1/FMRI_STUDIES_GRATTON_20210820_092658_908000
cd /Volumes/fsmresfiles/PBS/Gratton_Lab/Lifespan/Post-↙
COVID/BIDS/DICOMS/LS08_1/FMRI_STUDIES_GRATTON_20210820_092658_908000
info = dicominfo('LS08_1.MR.FMRI_STUDIES_GRATTON.↙
0006.0002.2021.08.20.11.04.25.695290.6470031.IMA')
cd /Users/dianaperez/Documents/GitHub/Lateralization_Variants/
permute_handedness
run('/Users/dianaperez/Documents/GitHub/General_Scripts/untitled4.m')
clear all
load('/Users/dianaperez/Desktop/HCP384_new_split_networksxHem_wBE.mat')
load('/Users/dianaperez/Desktop/HCP384_new_split_variants_info_wBE.mat')
numVars = variants_info.left_hem.group_avg{1,1};
LHem_numVars = variants_info.left_hem.group_avg{1,1};
RHem_numVars = variants_info.right_hem.group_avg{1,1};
clear numVars
avgVarSize = variants_info.left_hem.group_avg{:,3};
LHem_avgVarSize = variants_info.left_hem.group_avg{:,3};
RHem_avgVarSize = variants_info.right_hem.group_avg{:,3};
clear avgVarSize
```

```
RHem_numBorder = variants_info.right_hem.group_avg{:,4};
RHem_numEctopic = variants_info.right_hem.group_avg{:,5};
LHem_numBorder = variants_info.left_hem.group_avg{:,4};
LHem_numEctopic = variants_info.left_hem.group_avg{:,5};
[sig p ci stats] = ttest(LHem_avgVarSize, RHem_avgVarSize);
p_vals = [];
p_vals = [p_vals; p];
[sig p ci stats] = ttest(LHem_numVars, RHem_numVars);
LHem_numVars = variants_info.left_hem.group_avg{1,1};
LHem_numVars = variants_info.left_hem.group_avg{:,1};
RHem_numVars = variants_info.right_hem.group_avg{:,1};
[sig p ci stats] = ttest(LHem_numVars, RHem_numVars);
[sig p ci stats] = ttest(LHem_numBorder, RHem_numVars);
[sig p ci stats] = ttest(LHem_numBorder, RHem_numBorder);
[sig p ci stats] = ttest(LHem_numEctopic, RHem_numEctopic);
mean(LH_avgVarSize)
mean(LHem_avgVarSize)
mean(RHem_avgVarSize)
mean(LHem_numVars)
mean(RHem_numVars)
mean(RHem_numEctopic)
mean(RHem_numBorder)
mean(LHem_numBorder)
mean(LHem_numEctopic)
[sig p ci stats] = ttest(LHem_numVars, RHem_numVars);
p_vals = [p_vals; p];
[sig p ci stats] = ttest(LHem_numBorder, RHem_numBorder);
p_vals = [p_vals; p];
[sig p ci stats] = ttest(LHem_numEctopic, RHem_numEctopic);
p_vals = [p_vals; p];
[p_fdr, p_sig] = FDR(p_vals, .05)
addpath '/Users/dianaperez/Desktop'
[p_fdr, p_sig] = FDR(p_vals, .05)
clear LHem_numBorder LHem_numEctopic RHem_numBorder RHem_numEctopic
clear p*
clear sig stats ci ans
clear variants_info
histograms(LHem_avgVarSize)
histogram(LHem_avgVarSize)
hold on
network_names = {'DMN'  'Vis'   'FP'    'DAN'   'VAN'   'Sal'   'CO'    'SMd'   'SMl'↙
'Aud'   'Tpole' 'MTL'   'PMN'   'PON'};
wb_colors = [1 2 3 5 7 8 9 10 11 12 13 14 15 16];
results = [];
statistics = [];
for net = 1:numel(network_names)
left_hemi = networksxHem.clustersLH(:,net);
right_hemi = networksxHem.clustersRH(:,net);
results(net,1) = mean(left_hemi);
results(net,2) = mean(right_hemi);
[sig p ci stats] = ttest(left_hemi, right_hemi);
results(net,3) = sig;
results(net,4) = p;
statistics{net} = stats;
end
[p_fdr, results(:,5)] = FDR(results(:,4), .05);
network_names = {'DMN'  'Vis'   'FP'    'Reward' 'DAN'  'VAN' ' '   'Sal'   'CO'    'SMd'↙
'SMl'   'Aud'   'Tpole' 'MTL'   'PMN'   'PON'};
%network_names = {'DMN' 'Vis'   'FP'    'DAN'   'VAN'   'Sal'   'CO'    'SMd'   'SMl'↙
'Aud'   'Tpole' 'MTL'   'PMN'   'PON'};
```

```
results = [];
statistics = [];
for net = 1:numel(network_names)
left_hemi = networksxHem.clustersLH(:,net);
right_hemi = networksxHem.clustersRH(:,net);
results(net,1) = mean(left_hemi);
results(net,2) = mean(right_hemi);
[sig p ci stats] = ttest(left_hemi, right_hemi);
results(net,3) = sig;
results(net,4) = p;
statistics{net} = stats;
end
[p_fdr, results(:,5)] = FDR(results(:,4), .05);
bar(1:16, results(:,1:2))
legend('Left Hem', 'Right Hem')
bar(1:16, results(:,1:2))
legend('Left Hem', 'Right Hem')
bar(network_names, results(:,1:2))
bar(1:16, results(:,1:2))
legend('Left Hem', 'Right Hem')
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.5, 0.7, 0.5, 0.7]);
xticks(1:16)
xticklabels(network_names)
network_names = {'DMN'  'Vis'   'FP'    'Reward' 'DAN'  ' ' 'VAN'   'Sal'   'CO'    'SMd'↙
'SMl'   'Aud'   'Tpole' 'MTL'   'PMN'   'PON'};
xticklabels(network_names)
ax = gca;
ax.FontSize = 14;
network_names = {'DMN'  'Vis'   'FP'    ' ' 'DAN'   ' ' 'VAN'   'Sal'   'CO'    'SMd'↙
'SMl'   'Aud'   'Tpole' 'MTL'   'PMN'   'PON'};
xticklabels(network_names)
ylabel('Average Number of Variants Assigned to Network');
xlabel('Network');
title('Variants Assigned to Each Network Across Hemispheres');
print(gcf,'/Users/dianaperez/Desktop/Networks_by_Hem_new_split_vars.jpg'],'-dpng','-↙
r300');
print(gcf,'/Users/dianaperez/Desktop/Networks_by_Hem_new_split_vars.jpg','-dpng','-↙
r300');
Overlap_VANvars
DMN_overlap = ft_read_cifti_mod↙
('/Users/dianaperez/Desktop/HCP_newsplit_DMNvariants_OverlapMap_384GoodSubs.dtseries.↙
nii')
flip_DMN_overlap = insert_nonbrain(DMN_overlap.data, 'both', DMN_overlap);
64984/2
> left = flip_DMN_overlap(1:32492);
left = flip_DMN_overlap(1:32492);
right = flip_DMN_overlap(32493:end);
DMN_cifti_1 = [left; right];
DMN_cifti_1 = DMN_cifti_1(DMN_overlap.brainstructure>0);
DMN_cifti_2 = [right; left];
DMN_cifti_2 = DMN_cifti_2(DMN_overlap.brainstructure>0);
DMN_diff = DMN_cifti_ 1 - DMN_cifti_2;
DMN_diff = DMN_cifti_1 - DMN_cifti_2;
template = DMN_overlap;
template.data = DMN_diff;
ft_write_cifti_mod('/Users/dianaperez/Desktop/DMN_diff_map.dtseries.nii', template);
VIS_overlap = ft_read_cifti_mod↙
('/Users/dianaperez/Desktop/HCP_newsplit_VISvariants_OverlapMap_384GoodSubs.dtseries.↙
nii')
flip_VIS_overlap = insert_nonbrain(VIS_overlap.data, 'both', VIS_overlap);
```

```
> left = flip_VIS_overlap(1:32492);
left = flip_VIS_overlap(1:32492);
right = flip_VIS_overlap(32493:end);
VIS_cifti_1 = [left; right];
VIS_cifti_2 = [right; left];
VIS_cifti_1 = VIS_cifti_1(VIS_overlap.brainstructure>0);
VIS_cifti_2 = VIS_cifti_2(VIS_overlap.brainstructure>0);
VIS_diff = VIS_cifti_1 - VIS_cifti_2;
template.data = VIS_diff;
ft_write_cifti_mod('/Users/dianaperez/Desktop/VIS_diff_map.dtseries.nii', template);
VAN_overlap = ft_read_cifti_mod↙
('/Users/dianaperez/Desktop/HCP_newsplit_VANvariants_OverlapMap_384GoodSubs.dtseries.↙
nii')
all_verts = insert_nonbrain(VAN_overlap.data, 'both', VAN_overlap);
left = all_verts(1:32492);
right = all_verts(32493:end);
cifti_1 = [left; right];
cifti_2 = [right; left];
cifti_1 = cifti_1(VIS_overlap.brainstructure>0);
cifti_2 = cifti_2(VIS_overlap.brainstructure>0);
diff = cifti_1 - cifti_2;
template.data = diff;
ft_write_cifti_mod('/Users/dianaperez/Desktop/VAN_diff_map.dtseries.nii', template);
overlap = ft_read_cifti_mod↙
('/Users/dianaperez/Desktop/HCP_newsplit_CONvariants_OverlapMap_384GoodSubs.dtseries.↙
nii')
all_verts = insert_nonbrain(overlap.data, 'both', overlap);
left = all_verts(1:32492);
right = all_verts(32493:end);
cifti_1 = [left; right];
cifti_2 = [right; left];
cifti_1 = cifti_1(VIS_overlap.brainstructure>0);
cifti_2 = cifti_2(VIS_overlap.brainstructure>0);
diff = cifti_1 - cifti_2;
template.data = diff;
ft_write_cifti_mod('/Users/dianaperez/Desktop/CON_diff_map.dtseries.nii', template);
overlap = ft_read_cifti_mod↙
('/Users/dianaperez/Desktop/HCP_newsplit_SMLvariants_OverlapMap_384GoodSubs.dtseries.↙
nii')
all_verts = insert_nonbrain(overlap.data, 'both', overlap);
left = all_verts(1:32492);
right = all_verts(32493:end);
cifti_1 = [left; right];
cifti_2 = [right; left];
cifti_1 = cifti_1(VIS_overlap.brainstructure>0);
cifti_2 = cifti_2(VIS_overlap.brainstructure>0);
diff = cifti_1 - cifti_2;
template.data = diff;
ft_write_cifti_mod('/Users/dianaperez/Desktop/SML_diff_map.dtseries.nii', template);
Overlap_VANvars
unique(overlap_map(26000:end))
load('/Users/dianaperez/Desktop/HCP384_new_split_networksxHem.mat')
load('/Users/dianaperez/Desktop/HCP384_new_split_variants_info.mat')
clear al
clear all
load('/Users/dianaperez/Desktop/HCP384_new_split_networksxHem.mat')
load('/Users/dianaperez/Desktop/HCP384_new_split_variants_info.mat')
LHem = variants_info.left_hem.group_avg{1,1};
RHem = variants_info.right_hem.group_avg{1,1};
[sig p ci stats] = ttest(LHem, RHem);
```

```
LHem = variants_info.left_hem.group_avg{:,1};
RHem = variants_info.right_hem.group_avg{:,1};
[sig p ci stats] = ttest(LHem, RHem);
LHem_mean = mean(LHem);
RHem_mean = mean(RHem);
[sig p ci stats] = ttest(LHem, RHem);
disp(p)
if sig == 1
disp(['Comparison is significant with p = ' num2str(p)])
end
LHem_mean = mean(LHem)
RHem_mean = mean(RHem)
histogram(LHem)
hold on
histogram(RHem)
title(title_str)
xlabel(x_label)
ylabel(y_label)
legend('Left Hemisphere', 'Right Hemisphere')
ax = gca;
ax.FontSize = 14;
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.5, 0.7, 0.5, 0.7]);
LHem = variants_info.left_hem.group_avg{:,1};
RHem = variants_info.right_hem.group_avg{:,1};
title_str = 'Number of Variants Across Hemispheres';
x_label = 'Number of Clusters';
y_label = 'Frequency (Number of Subjects)';
outputName = 'HCP384_new_split_vars_numVars.jpg';
histogram(LHem)
hold on
histogram(RHem)
title(title_str)
xlabel(x_label)
ylabel(y_label)
legend('Left Hemisphere', 'Right Hemisphere')
ax = gca;
ax.FontSize = 14;
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.5, 0.7, 0.5, 0.7]);
LHem = variants_info.left_hem.group_avg{:,3};
RHem = variants_info.right_hem.group_avg{:,3};
title_str = 'Average Variant Size Across Hemispheres';
x_label = 'Average Variant Size (Number of Vertices)';
y_label = 'Frequency (Number of Subjects)';
outputName = 'HCP384_new_split_vars_avgVarSize.jpg';
[sig p ci stats] = ttest(LHem, RHem);
disp(p)
if sig == 1
disp(['Comparison is significant with p = ' num2str(p)])
end
LHem_mean = mean(LHem)
RHem_mean = mean(RHem)
histogram(LHem)
hold on
histogram(RHem)
title(title_str)
xlabel(x_label)
ylabel(y_label)
legend('Left Hemisphere', 'Right Hemisphere')
ax = gca;
ax.FontSize = 14;
```

```
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.5, 0.7, 0.5, 0.7]);
network_names = {'DMN'  'Vis'   'FP'    ' ' 'DAN'   ' ' 'VAN'   'Sal'   'CO'    'SMd'↙
'SMl'   'Aud'   'Tpole' 'MTL'   'PMN'   'PON'};
%network_names = {'DMN' 'Vis'   'FP'    'DAN'   'VAN'   'Sal'   'CO'    'SMd'   'SMl'↙
'Aud'   'Tpole' 'MTL'   'PMN'   'PON'};
results = [];
statistics = [];
for net = 1:numel(network_names)
left_hemi = networksxHem.clustersLH(:,net);
right_hemi = networksxHem.clustersRH(:,net);
results(net,1) = mean(left_hemi);
results(net,2) = mean(right_hemi);
[sig p ci stats] = ttest(left_hemi, right_hemi);
results(net,3) = sig;
results(net,4) = p;
statistics{net} = stats;
end
[p_fdr, results(:,5)] = FDR(results(:,4), .05);
bar(1:16, results(:,1:2))
legend('Left Hem', 'Right Hem')
xticks(1:16)
xticklabels(network_names)
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.5, 0.7, 0.5, 0.7]);
ylabel('Average Number of Variants Assigned to Network');
xlabel('Network');
title_str('Variants Assigned to Each Network Across Hemispheres');
Overlap_VANvars
%-- 9/2/21, 9:53 AM --%
permute_varSize
left_hem = allSubs_info.variants_info.left_hem.group_avg{:,4};
right_hem = allSubs_info.variants_info.right_hem.group_avg{:,4};
true_diff = mean(left_hem - right_hem);
flip_switch = zeros(length(left_hem),1);
flip_switch(1:(length(left_hem))/2) = 1;
for p = 1:numperms
rng('shuffle');
ind = randperm(length(flip_switch))';
rand_flip_switch = flip_switch(ind);
for s = 1:length(left_hem)
if rand_flip_switch(s) == 1
pseudo_left_hem(s,1) = left_hem(s);
pseudo_right_hem(s,1) = right_hem(s);
elseif rand_flip_switch(s) == 0
pseudo_right_hem(s,1) = left_hem(s);
pseudo_left_hem(s,1) = right_hem(s);
end
end
perm_diffs(p) = mean(pseudo_left_hem - pseudo_right_hem);
end
disp(['Average Number of Border Variants (permute hemispheres) - Below: ' num2str(length↙
(find(perm_diffs<true_diff))/1000)])
disp(['Average Number of Border Variants (permute hemispheres) - Above: ' num2str(length↙
(find(perm_diffs>true_diff))/1000)])
clear left_hem right_hem true_diff flip_switch rand_flip_switch pseudo_left_hem↙
pseudo_right_hem
%% Test diff in number of ectopic variants across hemispheres in all subjects
left_hem = allSubs_info.variants_info.left_hem.group_avg{:,5};
right_hem = allSubs_info.variants_info.right_hem.group_avg{:,5};
true_diff = mean(left_hem - right_hem);
flip_switch = zeros(length(left_hem),1);
```

```
flip_switch(1:(length(left_hem))/2) = 1;
for p = 1:numperms
rng('shuffle');
ind = randperm(length(flip_switch))';
rand_flip_switch = flip_switch(ind);
for s = 1:length(left_hem)
if rand_flip_switch(s) == 1
pseudo_left_hem(s,1) = left_hem(s);
pseudo_right_hem(s,1) = right_hem(s);
elseif rand_flip_switch(s) == 0
pseudo_right_hem(s,1) = left_hem(s);
pseudo_left_hem(s,1) = right_hem(s);
end
end
perm_diffs(p) = mean(pseudo_left_hem - pseudo_right_hem);
end
disp(['Average Number of Ectopic Variants (permute hemispheres) - Below: ' num2str(length↙
(find(perm_diffs<true_diff))/1000)])
disp(['Average Number of Ectopic Variants (permute hemispheres) - Above: ' num2str(length↙
(find(perm_diffs>true_diff))/1000)])
clear left_hem right_hem true_diff flip_switch rand_flip_switch pseudo_left_hem↙
pseudo_right_hem
permute_variantproperties
net_info.networksxHem.clustersLH{:,1}
net_info.networksxHem.clustersLH{1}
net_info.networksxHem.clustersLH(:,1)
permute_variantproperties
LHand_info.variants_info.both_hems{:,3}
%-- 9/10/21, 12:43 PM --%
load↙
('/Users/dianaperez/Desktop/Thesis/Spatial_Location/HCP/VariantsvsFlippedVariants_allSubs↙
_spCorr_1000_thresh_10_permutations.mat')
load↙
('/Users/dianaperez/Desktop/Thesis/Spatial_Location/HCP/VariantsvsFlippedVariants_allSubs↙
_true_spCorr_1000_thresh_10_permutations.mat')
scatter(spCorrs, 'jitter', 'on')
help scatter
scatter(spCorrs, 1:1000, 'jitter', 'on')
scatter(1:1000, spCorrs, 'jitter', 'on', 'jitterAmount', 0.5)
help plotspread
plotSpread
cd /Users/dianaperez/Documents/MATLAB/plotSpread/
plotSpread(spCorrs)
hold on
plotSpread(true_spCorr)
plotSpread(spCorrs, spCorr)
plotSpread(spCorrs, spCorrs)
data = {spCorrs, spCorrs, spCorrs};
ploteSpread(data,[],[],{'HCP', 'HCP split', 'MSC'});
plotSpread(data,[],[],{'HCP', 'HCP split', 'MSC'});
figure
plotSpread(data,[],[],{'HCP', 'HCP split', 'MSC'});
plotSpread(data,'categoryLabels',{'HCP', 'HCP split', 'MSC'});
true = {true_spCorr, true_spCorr, true_spCorr};
hold on
plotSpread(true)
close gcf
figure
plotSpread(data,'categoryLabels',{'HCP', 'HCP split', 'MSC'}, 'categoryMarkers',↙
{'o','o','o'}, 'categoryColors',{'r','b','g'});
```

```
plotSpread(data,'categoryLabels',{'HCP', 'HCP split', 'MSC'}, 'categoryMarkers',↙
{'o','o','o'}, 'categoryColors',{'r','r','r'});
data = [randn(50,1);randn(50,1)+3.5]*[1 1];
catIdx = [ones(50,1);zeros(50,1);randi([0,1],[100,1])];
figure
plotSpread(data,'categoryIdx',catIdx,...
'categoryMarkers',{'o','+'},'categoryColors',{'r','b'})
close gcf
data = [spCorrs; spCorrs];
catIdx = [ones(1000,1);zeroes(1000,1)];
catIdx = [ones(1000,1);zeros(1000,1)];
figure
plotSpread(data,'categoryIdx',catIdx,...
'categoryMarkers',{'o','+'},'categoryColors',{'r','b'})
data = [true_spCorr; spCorrs];
catIdx = [1;zeros(1000,1)];
plotSpread(data,'categoryIdx',catIdx,...
'categoryMarkers',{'o','+'},'categoryColors',{'r','b'})
'categoryMarkers',{'o','+'},'categoryColors',{'r','r'})
plotSpread(data,'categoryIdx',catIdx,...
'categoryMarkers',{'o','+'},'categoryColors',{'r','r'})
load('/Users/dianaperez/Desktop/Thesis/Variant_Properties/HCP384_new_split_variants_info.↙
mat')
numVars = variants_info.left_hem.group_avg{:,1};
variants_info.left_hem.group_avg.numVars(1) = 1;
LH = numVars;
RH = variants_info.right_hem.group_avg{:,1};
x = [LH RH];
al_goodplot(x)
diff = LH-RH;
al_goodplot(diff)
al_goodplot(x,[],[],[],'man')
close gcf
al_goodplot(LH)
al_goodplot(RH,[],[],[],'man')
close gcf
al_goodplot(LH,[],[],[],'left')
al_goodplot(RH,[],[],[],'right')
al_goodplot([],[],[],[],'man')
close gcf
al_goodplot(LH,0,.2,[],'left')
al_goodplot(RH,0,.2,[],'right')
legend('Left Hemisphere', 'Right Hemisphere')
legend('Right Hemisphere')
legend('Left Hemisphere',[], 'Right Hemisphere')
help findobj
h = findobj
m = findobj(gca, 'Type', 'Scatter');
legend(m(1:2), 'left hem', 'right hem')
legend(m(1:2), 'right hem', 'left hem')
close gcf
help distributionPlot
plot(spCorrs, 'MarkerEdgeColor', 'black')
close gcf
scatter(spCorrs, 'MarkerEdgeColor', 'black')
help scatter
scatter(spCorrs,1:1000, 'MarkerEdgeColor', 'black')
scatter(1:1000,spCorrs, 'MarkerEdgeColor', 'black')
hold on
scatter(500,true_spCorr, 'MarkerEdgeColor', 'red', 'MarkerFaceColor', 'red', 'SizeData',↙
```

```
50)
scatter(500,true_spCorr, 'MarkerEdgeColor', 'red', 'MarkerFaceColor', 'red', 'SizeData',↙
100)
scatter(1:1000,spCorrs, 'MarkerEdgeColor', 'black', 'XJitter', 'density)
scatter(1:1000,spCorrs, 'MarkerEdgeColor', 'black', 'XJitter', 'density')
close gcf
scatter(1:1000,spCorrs, 'MarkerEdgeColor', 'black', 'XJitter', 'density')
hold on
scatter(500,true_spCorr, 'MarkerEdgeColor', 'red', 'MarkerFaceColor', 'red', 'SizeData',↙
100)
axis(0,1000)
axis([0, 1000, .6, 1])
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.5, 0.7, 0.5, 0.7]);
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.7, 0.7, 0.5, 0.7]);
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.7, 0.7, 0.7, 0.7]);
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.7, 0.7, 0.3, 0.7]);
close gcf
scatter(1:1000,spCorrs, 'MarkerEdgeColor', 'black', 'SizeData', 50)
scatter(500,true_spCorr, 'MarkerEdgeColor', 'red', 'MarkerFaceColor', 'red', 'SizeData',↙
100)
hold on
scatter(1:1000,spCorrs, 'MarkerEdgeColor', 'black', 'SizeData', 50)
axis([0, 1000, .6, 1])
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.7, 0.7, 0.3, 0.7]);
scatter(1:1000,spCorrs, 'MarkerEdgeColor', 'black', 'SizeData', 100)
close gcf
scatter(1:1000,spCorrs, 'MarkerEdgeColor', 'black', 'SizeData', 150)
hold on
scatter(500,true_spCorr, 'MarkerEdgeColor', 'red', 'MarkerFaceColor', 'red', 'SizeData',↙
300)
close gcf
scatter(1:1000,spCorrs, 'MarkerEdgeColor', 'black', 'SizeData', 100)
scatter(500,true_spCorr, 'MarkerEdgeColor', 'red', 'MarkerFaceColor', 'red', 'SizeData',↙
200)
hold on
scatter(1:1000,spCorrs, 'MarkerEdgeColor', 'black', 'SizeData', 100)
axis([0, 1000, .6, 1])
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.7, 0.5, 0.3, 0.7]);
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.7, 0.7, 0.3, 0.7]);
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.7, 0.7, 0.3, 0.3]);
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.7, 0.7, 0.3, 0.9]);
axis([0, 1000, .65, 1])
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.7, 0.7, 0.3, 0.8]);
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.7, 0.7, 0.3, 0.7]);
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.7, 0.5, 0.3, 0.9]);
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.7, 0.3, 0.3, 0.9]);
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.7, 0.5, 0.3, 0.9]);
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.3, 0.9]);
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.3, 0.7]);
ylabel('Correlation')
ax = gca;
ax.FontSize = 14;
ax.FontSize = 24;
XTick()
xticks()
xticks(0)
xticks( )
xticks([])
yticks([1, .75,.65])
yticks([.65,.75,1])
```

```
print(gcf,↙
'/Users/dianaperez/Desktop/Thesis/Figures/Figure1_permutations_scatterplot_HCP.jpg', '-↙
dpng', '-r300')
scatter(1:3,spCorrs(1:3), 'MarkerEdgeColor', 'black', 'SizeData', 100)
close gcf
scatter(1:3,spCorrs(1:3), 'MarkerEdgeColor', 'black', 'SizeData', 100)
scatter(1:1000,spCorrs, 'MarkerEdgeColor', 'black', 'SizeData', 100)
close gcf
scatter(500,true_spCorr, 'MarkerEdgeColor', 'red', 'MarkerFaceColor', 'red', 'SizeData',↙
200)
hold on
scatter(1:1000,spCorrs, 'MarkerEdgeColor', 'black', 'SizeData', 100)
axis([0, 1000, .65, 1])
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.3, 0.7]); %first and second↙
control position on screen, third controls width, and fourth controls height
ylabel('Correlation')
xticks([])
yticks([.65,.75,1])
ax = gca;
ax.FontSize = 24;
m = findobj(gca 'Type', 'Scatter')
m = findobj(gca, 'Type', 'Scatter')
hleg1 = legend(m(1:2), 'TrueCorrelation', 'Permuted Correlatoin Values', 'Location',↙
'SouthWest');
hleg1 = legend(m(1:2), 'Permuted Correlatoin Values', 'TrueCorrelation', 'Location',↙
'Right');
hleg1 = legend(m(1:2), 'Permuted Correlatoin Values', 'TrueCorrelation', 'Location',↙
'westoutside');
hleg1 = legend(m(1:2), 'Permuted Correlatoin Values', 'TrueCorrelation', 'Location',↙
'eastoutside');
hleg1 = legend(m(1:2), 'Permuted Correlation Values', 'True Correlation', 'Location',↙
'eastoutside');
hleg1 = legend(m(1:2), 'Permuted Correlation Values', 'True Correlation', 'Location',↙
'southoutside');
leg_marks = findobj(hleg1, 'Type', 'Marker');
leg_marks = findobj(hleg1, 'Marker');
leg_marks = findobj(hleg1, 'Marker', 'none', '-xor');
leg_marks = findobj(hleg1, 'Type', 'Scatter');
help findobj
leg_marks = findobj(hleg1, 'Type', 'legend');
marks = findobj(leg_marks, 'Marker', 'none', '-xor')
set(marks, 'MarkerSize', 20)
m = findobj(hleg1, 'Type', 'patch');
set(m, 'MarkerSize', 50)
set(m, 'MarkerSize', 150)
m = findobj(gcf, 'Type', 'patch');
set(m, 'MarkerSize', 150)
m = findobj(gcf, 'type', 'patch');
m = findobj(gcf);
m = findobj(gcf)
m_l = findobj(m.Legend)
m
m.Legend
m = findobj(gcf, 'type', 'legend')
l = findobj(m, 'type', 'patch')
print(gcf,↙
'/Users/dianaperez/Desktop/Thesis/Figures/Figure1_permutations_scatterplot_HCP.jpg', '-↙
dpng', '-r300')
overlapmap
overlap = ft_read_cifti_mod↙
```

```
('/Users/dianaperez/Desktop/HCP_allSubs_OverlapMap_384GoodSubs_threshold_10.dtseries.↙
nii');
diffmat_file = overlap.data;
permutations_cluster_correction
trueDiff_cc = zeros(size(trueDiff));
size(trueDiff)
permutations_cluster_correction
size(diffmats)
clear size
size(diffmats)
permutations_cluster_correction
trueDiff_cc = zeros(size(trueDiff));
trueDiff_cc(truediff_bin==1) = trueDiff(truediff_bin==1);
template.data = trueDiff_cc;
ft_write_cifti_mod(outfile_diffmap, template);
%-- 9/13/21, 5:50 PM --%
permute_variantproperties
net_perms = [];
net_perms(1,1) = true_diff;
permute_variantproperties
net_perms(:,net)= [true_diff; perm_diffs'];
net_perms = [];
net_perms(:,net)= [true_diff; perm_diffs'];
permute_variantproperties
help save
permute_variantproperties
length(find(net_perms(2:end,1)<net_perms(1,1)))/1000
length(find(net_perms(2:end,1)<net_perms(1,1)))
find(net_perms(2:end,1)<net_perms(1,1))
1/1000
save([outputDir 'network_perms_numVars.mat'], 'net_perms');
3/10
permute_variantproperties
clear all
load('/Users/dianaperez/Desktop/Thesis/Variant_Properties/HCP384_new_split_variants_info.↙
mat')
avgVarSize = variants_info.left_hem.group_avg{:,3};
leftHem = variants_info.left_hem.group_avg{:,3};
rightHem = variants_info.right_hem.group_avg{:,3};
[h,mu,sigma,q,notch] = al_goodplot(leftHem,0,'left');
addpath '/Users/dianaperez/Documents/MATLAB/upload'
[h,mu,sigma,q,notch] = al_goodplot(leftHem,0,'left');
[h,mu,sigma,q,notch] = al_goodplot(leftHem,0,[],'left');
[h,mu,sigma,q,notch] = al_goodplot(leftHem,0,[],[],'left');
[h,mu,sigma,q,notch] = al_goodplot(rightHem,0,[],[],'right');
[h,mu,sigma,q,notch] = al_goodplot(leftHem,0,.2,[],'left');
[h,mu,sigma,q,notch] = al_goodplot(rightHem,0,.2,[],'right');
axis([-0.5, 0.5, 0, 400])
axis([-0.4, 0.4, 0, 400])
xticks([])
axis([-0.4, 0.4, 50, 400])
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.3, 0.7]);
axis([-0.4, 0.4, 50, 350])
ylabel('Average Variant Size in Vertices')
ax = gca;
ax.FontSize = 24;
hleg1 = legend(m(1:2), 'Right Hemisphere', 'Left Hemisphere', 'Location',↙
'SouthOutside');
hleg1.FontSize = 14;
m = findobj(gca);
```

```
findobj(gca)
m = findobj(gca, 'Type', 'Scatter');
hleg1 = legend(m(1:2), 'Right Hemisphere', 'Left Hemisphere', 'Location',↙
'SouthOuthside');
hleg1 = legend(m(1:2), 'Permuted Correlation Values', 'True Correlation', 'Location',↙
'SouthOutside');
hleg1 = legend(m(1:2), 'Right Hemisphere', 'Left Hemisphere', 'Location',↙
'SouthOutside');
[h,mu,sigma,q,notch] = al_goodplot(rightHem,0,.2,[],'man');
[h,mu,sigma,q,notch] = al_goodplot(leftHem,0,.2,[],'left');
[h,mu,sigma,q,notch] = al_goodplot(rightHem,0,.2,[],'right');
xticks([])
axis([-0.4, 0.4, 50, 400])
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.3, 0.7]); %first and second↙
control position on screen, third controls width, and fourth controls height
m = findobj(gca, 'Type', 'Scatter');
hleg1 = legend(m(1:2), 'Right Hemisphere', 'Left Hemisphere', 'Location',↙
'SouthOutside');
ax = gca;
ax.FontSize = 24;
ylabel('Average Variant Size in Vertices')
print(gcf, '/Users/dianaperez/Desktop/Thesis/Figures/Figure2_violin_avgVarSize_HCP.jpg',↙
'-dpng', '-r300')
numVarsLH = variants_info.left_hem.group_avg{:,1};
numVarsRH = variants_info.right_hem.group_avg{:,1};
numBorderLH = variants_info.left_hem.group_avg{:,4};
numBorderRH = variants_info.right_hem.group_avg{:,4};
numEctopicLH = variants_info.left_hem.group_avg{:,5};
numEctopicRH = variants_info.right_hem.group_avg{:,5};
leftHem = [numVarsLH numBorderLH numEctopicLH];
rightHem = [numVarsRH numBorderRH numEctopicRH];
[h,mu,sigma,q,notch] = al_goodplot(leftHem,0,.2,[],'left');
[h,mu,sigma,q,notch] = al_goodplot(rightHem,0,.2,[],'right');
xticks([])
axis([-0.4, 0.4, 50, 400])
ax = gca;
ax.FontSize = 24;
ylabel('Average Variant Size in Vertices')
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.3, 0.7]); %first and second↙
control position on screen, third controls width, and fourth controls height
m = findobj(gca, 'Type', 'Scatter');
hleg1 = legend(m(1:2), 'Right Hemisphere', 'Left Hemisphere', 'Location',↙
'SouthOutside');
numVarsLH = variants_info.left_hem.group_avg{:,1};
numVarsRH = variants_info.right_hem.group_avg{:,1};
numBorderLH = variants_info.left_hem.group_avg{:,4};
numBorderRH = variants_info.right_hem.group_avg{:,4};
numEctopicLH = variants_info.left_hem.group_avg{:,5};
numEctopicRH = variants_info.right_hem.group_avg{:,5};
leftHem = [numVarsLH numBorderLH numEctopicLH];
rightHem = [numVarsRH numBorderRH numEctopicRH];
[h,mu,sigma,q,notch] = al_goodplot(leftHem,[],.2,[],'left');
[h,mu,sigma,q,notch] = al_goodplot(rightHem,[],.2,[],'right');
xticks([])
%axis([-0.4, 0.4, 50, 400])
ax = gca;
ax.FontSize = 24;
[h,mu,sigma,q,notch] = al_goodplot(leftHem,[],.2,[],'left');
[h,mu,sigma,q,notch] = al_goodplot(leftHem,[-1,0,1],.2,[],'left');
[h,mu,sigma,q,notch] = al_goodplot(rightHem,[-1,0,1],.2,[],'right');
```

```
colorOrder = get(gca, 'ColorOrder');
colorOrder = get(gca, 'ColorOrder')
[h,mu,sigma,q,notch] = al_goodplot(rightHem,[-1,0,1],.2,[ 0    0.4470↙
0.7410],'right');
[h,mu,sigma,q,notch] = al_goodplot(rightHem,[-1,0,1],.2,[ 0.8500    0.3250↙
0.0980],'right');
[h,mu,sigma,q,notch] = al_goodplot(rightHem,[-1,0,1],.2,[ 0.9290    0.6940↙
0.1250],'right');
[h,mu,sigma,q,notch] = al_goodplot(rightHem,[-1,0,1],.2,[0.4940    0.1840↙
0.5560],'right');
[h,mu,sigma,q,notch] = al_goodplot(rightHem,[-1,0,1],.2,[0.4660    0.6740↙
0.1880],'right');
[h,mu,sigma,q,notch] = al_goodplot(rightHem,[-1,0,1],.2,[    0.3010    0.7450↙
0.9330],'right');
figure
[h,mu,sigma,q,notch] = al_goodplot(rightHem,[-1,0,1],.2,[ 0    0.4470↙
0.7410],'right');
[h,mu,sigma,q,notch] = al_goodplot(leftHem,[-1,0,1],.2,[ 0    0.4470    0.7410],'left');
[h,mu,sigma,q,notch] = al_goodplot(rightHem,[-1,0,1],.2,[0.4660    0.6740↙
0.1880],'right');
xticks([])
ax = gca;
ax.FontSize = 24;
ylabel('Number of Variants')
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.7, 0.7]);
yticks([-1,0,1])
yticklabels({'All Variants', 'Border Shifts', 'Ectopic Intrusions'})
xticklabels({'All Variants', 'Border Shifts', 'Ectopic Intrusions'})
xticks([-1,0,1])
[h,mu,sigma,q,notch] = al_goodplot(leftHem,[-1,0,1],.2,[ 0    0.4470    0.7410],'left');
[h,mu,sigma,q,notch] = al_goodplot(rightHem,[-1,0,1],.2,[0.4660    0.6740↙
0.1880],'right');
%axis([-0.4, 0.4, 50, 400])
ax = gca;
ax.FontSize = 24;
ylabel('Number of Variants')
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.7, 0.7]); %first and second↙
control position on screen, third controls width, and fourth controls height
xticklabels({'All Variants', 'Border Shifts', 'Ectopic Intrusions'})
xticks([-1,0,1])
m = findobj(gca, 'Type', 'Scatter')
hleg1 = legend(m(1:2), 'Right Hemisphere', 'Left Hemisphere', 'Location',↙
'SouthOutside');
print(gcf,↙
'/Users/dianaperez/Desktop/Thesis/Figures/Figure2_violin_numVarsBorderEctopic_HCP.jpg',↙
'-dpng', '-r300')
[h,mu,sigma,q,notch] = al_goodplot(leftHem,[-1,0,1],.2,[ 0    0.4470    0.7410],'left');
[h,mu,sigma,q,notch] = al_goodplot(rightHem,[-1,0,1],.2,[0.4660    0.6740↙
0.1880],'right');
%axis([-0.4, 0.4, 50, 400])
ax = gca;
ax.FontSize = 24;
ylabel('Number of Variants')
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.7, 0.7]); %first and second↙
control position on screen, third controls width, and fourth controls height
xticklabels({'All Variants', 'Border Shifts', 'Ectopic Intrusions'})
xticks([-1,0,1])
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.5, 0.7]); %first and second↙
control position on screen, third controls width, and fourth controls height
print(gcf,↙
```

```
'/Users/dianaperez/Desktop/Thesis/Figures/Figure2_violin_numVarsBorderEctopic_HCP.jpg',↙
'-dpng', '-r300')
leftHem = variants_info.left_hem.group_avg{:,3};
rightHem = variants_info.right_hem.group_avg{:,3};
[h,mu,sigma,q,notch] = al_goodplot(leftHem,0,.2,[],'left');
[h,mu,sigma,q,notch] = al_goodplot(rightHem,0,.2,[],'right');
xticks([])
axis([-0.4, 0.4, 50, 400])
ax = gca;
ax.FontSize = 24;
ylabel('Average Variant Size in Vertices')
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.3, 0.7]); %first and second↙
control position on screen, third controls width, and fourth controls height
%m = findobj(gca, 'Type', 'Scatter');
%hleg1 = legend(m(1:2), 'Right Hemisphere', 'Left Hemisphere', 'Location',↙
'SouthOutside');
print(gcf, '/Users/dianaperez/Desktop/Thesis/Figures/Figure2_violin_avgVarSize_HCP.jpg',↙
'-dpng', '-r300')
leftHem = variants_info.left_hem.group_avg{:,3};
rightHem = variants_info.right_hem.group_avg{:,3};
[h,mu,sigma,q,notch] = al_goodplot(leftHem,0,.2,[ 0    0.4470    0.7410],'left');
[h,mu,sigma,q,notch] = al_goodplot(rightHem,0,.2,[0.4660    0.6740    0.1880],'right');
xticks([0])
xticklabels('Average Variant Size')
axis([-0.4, 0.4, 50, 400])
ax = gca;
ax.FontSize = 24;
ylabel('Number of Vertices')
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.3, 0.7]); %first and second↙
control position on screen, third controls width, and fourth controls height
%m = findobj(gca, 'Type', 'Scatter');
%hleg1 = legend(m(1:2), 'Right Hemisphere', 'Left Hemisphere', 'Location',↙
'SouthOutside');
print(gcf, '/Users/dianaperez/Desktop/Thesis/Figures/Figure2_violin_avgVarSize_HCP.jpg',↙
'-dpng', '-r300')
load↙
('/Users/dianaperez/Desktop/Thesis/Variant_Properties/Permutation_Tests/HCP384_LhemvsRhem↙
_num_ectopic_ints.mat')
load↙
('/Users/dianaperez/Desktop/Thesis/Variant_Properties/Permutation_Tests/HCP384_LhemvsRhem↙
_num_border_shifts.mat')
load↙
('/Users/dianaperez/Desktop/Thesis/Variant_Properties/Permutation_Tests/HCP384_LhemvsRhem↙
_var_size.mat')
load↙
('/Users/dianaperez/Desktop/Thesis/Variant_Properties/Permutation_Tests/HCP384_LhemvsRhem↙
_num_vars.mat')
clear all
load↙
('/Users/dianaperez/Desktop/Thesis/Variant_Properties/Permutation_Tests/HCP384_LhemvsRhem↙
_num_ectopic_ints.mat')
perms_ectopic = output_mat;
perms_border = load↙
('/Users/dianaperez/Desktop/Thesis/Variant_Properties/Permutation_Tests/HCP384_LhemvsRhem↙
_num_border_shifts.mat');
load↙
('/Users/dianaperez/Desktop/Thesis/Variant_Properties/Permutation_Tests/HCP384_LhemvsRhem↙
_num_border_shifts.mat')
perms_border = output_mat;
load↙
```

```
('/Users/dianaperez/Desktop/Thesis/Variant_Properties/Permutation_Tests/HCP384_LhemvsRhem↙
_var_size.mat')
perms_varSize = output_mat;
load↙
('/Users/dianaperez/Desktop/Thesis/Variant_Properties/Permutation_Tests/HCP384_LhemvsRhem↙
_num_vars.mat')
perms_numVars = output_mat;
clear output_mat
all_perms = [perms_varSize perms_numVars perms_border perms_ectopic];
ind = zeros(1:1001);
ind = zeros(1001,1);
ind(1,1) = 1;
handles = plotSpread(all_perms, 'categoryIdx', [ind ind ind ind])
addpath '/Users/dianaperez/Documents/MATLAB/plotSpread/plotSpread'
handles = plotSpread(all_perms, 'categoryIdx', [ind ind ind ind])
handles = plotSpread(all_perms, 'categoryIdx', [ind ind ind ind], 'distributionMarkers',↙
{'Variant Size', 'Number of Variants', 'Number of Border Shifts', 'Number of Ectopic↙
Intrusions'})
handles = plotSpread(all_perms, 'distributionMarkers', {'Variant Size', 'Number of↙
Variants', 'Number of Border Shifts', 'Number of Ectopic Intrusions'}, 'categoryIdx',↙
[ind ind ind ind])
dist_labels = {'Variant Size', 'Number of Variants', 'Number of Border Shifts', 'Number↙
of Ectopic Intrusions'};
handles = plotSpread(all_perms, 'distributionMarkers', dist_labels, 'categoryIdx', [ind↙
ind ind ind])
handles = plotSpread(all_perms, 'categoryMarkers', dist_labels, 'categoryIdx', [ind ind↙
ind ind])
handles = plotSpread(all_perms, 'categoryMarkers', {'Variant Size', 'Number of Variants',↙
'Number of Border Shifts', 'Number of Ectopic Intrusions'}, 'categoryIdx', [ind ind ind↙
ind])
handles = plotSpread(all_perms, 'categoryMarkers', {'True Correlation', 'Permuted↙
Correlations'}, 'categoryIdx', [ind ind ind ind])
handles = plotSpread(all_perms, 'categoryLabels', {'True Correlation', 'Permuted↙
Correlations'}, 'categoryIdx', [ind ind ind ind])
all_perms = all_perms(:,2:4);
handles = plotSpread(all_perms, 'categoryLabels', {'Permuted Correlations','True↙
Correlation'}, 'categoryIdx', [ind ind ind])
handles = plotSpread(all_perms, 'categoryLabels', {'Permuted Correlations','True↙
Correlation'}, 'categoryIdx', [ind ind ind], 'xNames', {'Number of Variants', 'Number of↙
Border Variants', 'Number of Ectopic Variants'})
handles = plotSpread(all_perms, 'categoryLabels', {'Permuted Correlations','True↙
Correlation'}, 'categoryIdx', [ind ind ind], 'xNames', {'Number of Variants', 'Number of↙
Border Variants', 'Number of Ectopic Variants'}, 'xValues', [1,3,5])
plotColors(:,1) = [0,0,0];
plotColors(:,2) = [255,0,0];
plotColors(:,1) = mat2cell([0,0,0]);
for x = 1:nData
plotColors(nData,1) = [0,0,0];
plotColors(nData,2) = [255,0,0];
end
help applycform
help repmat
black_markers = [0,0,0];
red_markers = [255,0,0];
plotColors = repmat([black_markers red_markers], nData,1);
plotColors = repmat([black_markers red_markers]', nData,1);
black_markers = '[0,0,0]';
red_markers = '[255,0,0]';
plotColors = repmat([black_markers red_markers], nData,1);
plotSpread
```

```
handles = plotSpread(all_perms, 'categoryLabels', {'Permuted Correlations','True↙
Correlation'}, 'categoryIdx', [ind ind ind], 'xNames', {'Number of Variants', 'Number of↙
Border Variants', 'Number of Ectopic Variants'}, 'xValues', [1,3,5])
plotColors{1,1} = [0,0,0];
plotColors{2,1} = [0,0,0];
plotColors{3,1} = [0,0,0];
plotColors{1,2} = [255,0,0];
plotColors{2,2} = [255,0,0];
plotColors{3,2} = [255,0,0];
ph(iData,iCategory) = plot(ah,data(currentIdx,1),...
data(currentIdx,2),...
'marker',plotMarkers{iData,iCategory},...
'markeredgecolor',plotColors{iData,iCategory},...
%'lineStyle','none',...
'sizedata', 100,...
'DisplayName',plotLabels{iData,iCategory});
ph(iData,iCategory) = plot(ah,data(currentIdx,1),...
data(currentIdx,2),...
'marker',plotMarkers{iData,iCategory},...
'markeredgecolor',plotColors{iData,iCategory},...
'sizedata', 100,...
'DisplayName',plotLabels{iData,iCategory});
plotSpread
handles = plotSpread(all_perms, 'categoryLabels', {'Permuted Correlations','True↙
Correlation'}, 'categoryIdx', [ind ind ind], 'xNames', {'Number of Variants', 'Number of↙
Border Variants', 'Number of Ectopic Variants'}, 'xValues', [1,3,5])
plotSpread
handles = plotSpread(all_perms, 'categoryLabels', {'Permuted Correlations','True↙
Correlation'}, 'categoryIdx', [ind ind ind], 'xNames', {'Number of Variants', 'Number of↙
Border Variants', 'Number of Ectopic Variants'}, 'xValues', [1,3,5])
plotSpread
handles = plotSpread(all_perms, 'categoryLabels', {'Permuted Correlations','True↙
Correlation'}, 'categoryIdx', [ind ind ind], 'xNames', {'Number of Variants', 'Number of↙
Border Variants', 'Number of Ectopic Variants'}, 'xValues', [1,3,5])
handles = plotSpread(all_perms, 'categoryMarkers', {'bo', 'r'}, 'categoryLabels',↙
{'Permuted Correlations','True Correlation'}, 'categoryIdx', [ind ind ind], 'xNames',↙
{'Number of Variants', 'Number of Border Variants', 'Number of Ectopic Variants'},↙
'xValues', [1,3,5])
handles = plotSpread(all_perms, 'categoryMarkers', {'o', 'o'}, 'categoryLabels',↙
{'Permuted Correlations','True Correlation'}, 'categoryIdx', [ind ind ind], 'xNames',↙
{'Number of Variants', 'Number of Border Variants', 'Number of Ectopic Variants'},↙
'xValues', [1,3,5])
handles = plotSpread(all_perms, 'categoryMarkers', {'o', ''}, 'categoryLabels',↙
{'Permuted Correlations','True Correlation'}, 'categoryIdx', [ind ind ind], 'xNames',↙
{'Number of Variants', 'Number of Border Variants', 'Number of Ectopic Variants'},↙
'xValues', [1,3,5])
handles = plotSpread(all_perms, 'categoryMarkers', {'o', '.'}, 'categoryLabels',↙
{'Permuted Correlations','True Correlation'}, 'categoryIdx', [ind ind ind], 'xNames',↙
{'Number of Variants', 'Number of Border Variants', 'Number of Ectopic Variants'},↙
'xValues', [1,3,5])
plotSpread
handles = plotSpread(all_perms, 'categoryMarkers', {'o', '.'}, 'categoryLabels',↙
{'Permuted Correlations','True Correlation'}, 'categoryIdx', [ind ind ind], 'xNames',↙
{'Number of Variants', 'Number of Border Variants', 'Number of Ectopic Variants'},↙
'xValues', [1,3,5])
plot(all_perms(1,:), 'MarkerEdgeColor', 'red', 'MarkerFaceColor', 'red', 'MarkerSize',↙
50)
plot(all_perms(1,:), 'MarkerEdgeColor', 'red', 'MarkerFaceColor', 'red', 'MarkerSize',↙
100, 'linestyle', 'none')
handles = plotSpread(all_perms, 'categoryMarkers', {'o', '.'}, 'categoryLabels',↙
```

```
{'Permuted Correlations','True Correlation'}, 'categoryIdx', [ind ind ind], 'xNames',↙
{'Number of Variants', 'Number of Border Variants', 'Number of Ectopic Variants'},↙
'xValues', [1,3,5])
plot(all_perms(1,:), 'MarkerEdgeColor', 'red', 'MarkerFaceColor', 'red', 'MarkerSize',↙
100, 'linestyle', 'none')
plot([1,3,5],all_perms(1,:), 'MarkerEdgeColor', 'red', 'MarkerFaceColor', 'red',↙
'MarkerSize', 100, 'linestyle', 'none')
handles = plotSpread(all_perms(2:end,:), 'categoryMarkers', {'o'}, 'xNames', {'Number of↙
Variants', 'Number of Border Variants', 'Number of Ectopic Variants'}, 'xValues',↙
[1,3,5])
hold on
plot([1,3,5],all_perms(1,:), 'MarkerEdgeColor', 'red', 'MarkerFaceColor', 'red',↙
'MarkerSize', 100, 'linestyle', 'none')
plot([1,3,5],all_perms(1,:), 'MarkerEdgeColor', 'red', 'MarkerFaceColor', 'r',↙
'MarkerSize', 12, 'linestyle', 'none')
plot([1,3,5],all_perms(1,:), 'MarkerFaceColor', 'r', 'MarkerSize', 12, 'linestyle',↙
'none')
scatter([1,3,5],all_perms(1,:), 'MarkerFaceColor', 'r', 'SizeData', 50)
handles = plotSpread(all_perms, 'categoryMarkers', {'o', '.'}, 'categoryLabels',↙
{'Permuted Correlations','True Correlation'}, 'categoryIdx', [ind ind ind], 'xNames',↙
{'Number of Variants', 'Number of Border Variants', 'Number of Ectopic Variants'},↙
'xValues', [1,3,5])
scatter([1,3,5],all_perms(1,:), 'MarkerEdgeColor', 'red', 'MarkerFaceColor', 'red',↙
'SizeData', 50)
ax = gca;
ax.FontSize = 24;
ylabel('Number of Variants')
xticklabels({'All Variants', 'Border Shifts', 'Ectopic Intrusions'})
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.5, 0.7]); %first and second↙
control position on screen, third controls width, and fourth controls height
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.7, 0.7]); %first and second↙
control position on screen, third controls width, and fourth controls height
print(gcf,↙
'/Users/dianaperez/Desktop/Thesis/Figures/Figure3_spreadPlot_numVarsBorderEctopic_HCP.↙
jpg', '-dpng', '-r300')
handles = plotSpread(perms_varSize, 'categoryMarkers', {'o', '.'}, 'categoryLabels',↙
{'Permuted Correlations','True Correlation'}, 'categoryIdx', ind, 'xNames', {'Average↙
Variant Size'}, 'xValues', [1])
scatter(1,perms_varSize(1,:), 'MarkerEdgeColor', 'red', 'MarkerFaceColor', 'red',↙
'SizeData', 50)
ax = gca;
ax.FontSize = 24;
axis([-0.4, 0.4, 50, 400])
axis([-0.4, 0.4, 0, 1])
handles = plotSpread(perms_varSize, 'categoryMarkers', {'o', '.'}, 'categoryLabels',↙
{'Permuted Correlations','True Correlation'}, 'categoryIdx', ind, 'xNames', {'Average↙
Variant Size'}, 'xValues', [1])
scatter(1,perms_varSize(1,:), 'MarkerEdgeColor', 'red', 'MarkerFaceColor', 'red',↙
'SizeData', 50)
ax = gca;
ax.FontSize = 24;
axis([-0.4, 0.4, -25, 10])
axis([0, 2, -25, 10])
axis([0.5, 1.5, -25, 10])
axis([0, 2, -25, 10])
axis([0.25, 1.25, -25, 10])
axis([0.75, 1.25, -25, 10])
axis([0.5, 1.5, -25, 10])
ylabel('Number of Vertices')
ylabel('Difference in Number of Vertices (Left Hem - Right Hem')
```

```
ylabel('Difference in Number of Vertices')
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.7, 0.7]); %first and second↙
control position on screen, third controls width, and fourth controls height
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.3, 0.7]); %first and second↙
control position on screen, third controls width, and fourth controls height
print(gcf, '/Users/dianaperez/Desktop/Thesis/Figures/Figure3_spreadPlot_varSize_HCP.jpg',↙
'-dpng', '-r300')
m = findobj(gca, 'Type', 'Scatter')
handles = plotSpread(all_perms, 'categoryMarkers', {'o', '.'}, 'categoryLabels',↙
{'Permuted Correlations','True Correlation'}, 'categoryIdx', [ind ind ind], 'xNames',↙
{'Number of Variants', 'Number of Border Variants', 'Number of Ectopic Variants'},↙
'xValues', [1,3,5])
scatter([1,3,5],all_perms(1,:), 'MarkerEdgeColor', 'red', 'MarkerFaceColor', 'red',↙
'SizeData', 50)
ax = gca;
ax.FontSize = 24;
ylabel('Difference in Number of Variants')
xticklabels({'All Variants', 'Border Shifts', 'Ectopic Intrusions'})
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.7, 0.7]); %first and second↙
control position on screen, third controls width, and fourth controls height
print(gcf,↙
'/Users/dianaperez/Desktop/Thesis/Figures/Figure3_spreadPlot_numVarsBorderEctopic_HCP.↙
jpg', '-dpng', '-r300')
handles = plotSpread(all_perms, 'categoryMarkers', {'o', '.'}, 'categoryLabels',↙
{'Permuted Correlations','True Correlation'}, 'categoryIdx', [ind ind ind], 'xNames',↙
{'Number of Variants', 'Number of Border Variants', 'Number of Ectopic Variants'},↙
'xValues', [1,3,5])
scatter([1,3,5],all_perms(1,:), 'MarkerEdgeColor', 'red', 'MarkerFaceColor', 'red',↙
'SizeData', 50)
ax = gca;
ax.FontSize = 24;
ylabel('Difference in Number of Variants')
xticklabels({'All Variants', 'Border Shifts', 'Ectopic Intrusions'})
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.7, 0.7]); %first and second↙
control position on screen, third controls width, and fourth controls height
axis([0.5, 5.5, -.6, .6])
print(gcf,↙
'/Users/dianaperez/Desktop/Thesis/Figures/Figure3_spreadPlot_numVarsBorderEctopic_HCP.↙
jpg', '-dpng', '-r300')
axis([0.25, 5.75, -.6, .6])
axis([0, 6, -.6, .6])
print(gcf,↙
'/Users/dianaperez/Desktop/Thesis/Figures/Figure3_spreadPlot_numVarsBorderEctopic_HCP.↙
jpg', '-dpng', '-r300')
handles = plotSpread(all_perms, 'categoryMarkers', {'o', '.'}, 'categoryLabels',↙
{'Permuted Correlations','True Correlation'}, 'categoryColors', {'k','r'}, 'categoryIdx',↙
[ind ind ind], 'xNames', {'Number of Variants', 'Number of Border Variants', 'Number of↙
Ectopic Variants'}, 'xValues', [1,3,5])
load↙
('/Users/dianaperez/Desktop/Thesis/Variant_Properties/Network_Comparisons/network_perms_n↙
umVars.mat')
good_nets = [net_perms(:,1:3) net_perms(:,5) net_perms(:,7:12) net_perms(:,14:end)];
good_nets = [net_perms(:,1:3) net_perms(:,5) net_perms(:,7:end)];
rgb_colors = [1 0 0;
0 0 .6;
1 1 0;
.67 .67 .67;
0 .8 0;
.67 .67 .67;
0 .6 .6;
```

```
0 0 0;
.3 0 .6;
.2 1 1;
1 .5 0;
.6 .2 1;
.2 1 .2;
0 .2 .4;
0 0 1;
.8 .8 .6;
.4 0 0];
rgb_colors = [1 0 0;
0 0 .6;
1 1 0;
0 .8 0;
0 .6 .6;
0 0 0;
.3 0 .6;
.2 1 1;
1 .5 0;
.6 .2 1;
.2 1 .2;
0 .2 .4;
0 0 1;
.8 .8 .6];
handles = plotSpread(all_perms, 'categoryMarkers', {'o', '.'}, 'categoryLabels',↙
{'Permuted Correlations','True Correlation'}, 'categoryColors', {'k','r'}, 'categoryIdx',↙
[ind ind ind], 'xNames', {'Number of Variants', 'Number of Border Variants', 'Number of↙
Ectopic Variants'}, 'xValues', [1,3,5])
network_names = {'DMN'  'Vis'   'FP' 'DAN' 'VAN'    'Sal'   'CO'    'SMd'   'SMl'   'Aud'↙
'Tpole' 'MTL'   'PMN'   'PON'};
handles = plotSpread(good_nets, 'categoryMarkers', {'x', '.'}, 'categoryLabels',↙
{'Permuted Differences','True Difference'}, 'distriutionColors', rgb_colors,↙
'categoryIdx', [ind ind ind ind ind ind ind ind ind ind ind ind ind ind], 'xNames',↙
network_names)
for n = 1:numel(network_names)
rgb_for_plot{n} = rgb_color(n,:);
end
for n = 1:numel(network_names)
rgb_for_plot{n} = rgb_colors(n,:);
end
handles = plotSpread(good_nets, 'categoryMarkers', {'x', '.'}, 'categoryLabels',↙
{'Permuted Differences','True Difference'}, 'distriutionColors', rgb_for_plot,↙
'categoryIdx', [ind ind ind ind ind ind ind ind ind ind ind ind ind ind], 'xNames', )
handles = plotSpread(good_nets, 'categoryMarkers', {'x', '.'}, 'categoryLabels',↙
{'Permuted Differences','True Difference'}, 'distriutionColors', rgb_for_plot,↙
'categoryIdx', [ind ind ind ind ind ind ind ind ind ind ind ind ind ind], 'xNames')
handles = plotSpread(good_nets, 'categoryMarkers', {'x', '.'}, 'categoryLabels',↙
{'Permuted Differences','True Difference'}, 'distriutionColors', rgb_for_plot',↙
'categoryIdx', [ind ind ind ind ind ind ind ind ind ind ind ind ind ind])
handles = plotSpread(good_nets, 'categoryMarkers', {'x', '.'}, 'categoryLabels',↙
{'Permuted Differences','True Difference'}, 'distributionColors', rgb_for_plot',↙
'categoryIdx', [ind ind ind ind ind ind ind ind ind ind ind ind ind ind])
rgb_colors = [1 0 0;
0 0 .6;
1 1 0;
0 .8 0;
0 .6 .6;
0 0 0;
.3 0 .6;
.2 1 1;
```

```
1 .5 0;
.6 .2 1;
.2 1 .2;
0 .2 .4;
0 0 1;
.4 0 0];
rgb_for_plot = {};
for n = 1:numel(network_names)
rgb_for_plot{n} = rgb_colors(n,:);
end
handles = plotSpread(good_nets, 'categoryMarkers', {'x', '.'}, 'categoryLabels',↙
{'Permuted Differences','True Difference'}, 'distriutionColors', rgb_for_plot,↙
'categoryIdx', [ind ind ind ind ind ind ind ind ind ind ind ind ind ind], 'xNames', )
handles = plotSpread(good_nets, 'categoryMarkers', {'x', '.'}, 'categoryLabels',↙
{'Permuted Differences','True Difference'}, 'distributionColors', rgb_for_plot',↙
'categoryIdx', [ind ind ind ind ind ind ind ind ind ind ind ind ind ind])
rgb_colors = [1 0 0;
0 0 .6;
1 1 0;
0 .8 0;
0 .6 .6;
0 0 0;
.3 0 .6;
.2 1 1;
1 .5 0;
.6 .2 1;
.2 1 .2;
0 .2 .4;
0 0 1;
.8 .8 .6];
net_inds = [ind ind ind ind ind ind ind ind ind ind ind ind ind ind];
handles = plotSpread(good_nets, 'categoryMarkers', {'x', '.'}, 'categoryLabels',↙
{'Permuted Differences','True Difference'}, 'distributionColors', rgb_for_plot',↙
'categoryIdx', net_inds, 'xNames', network_names)
rgb_colors = [1 0 0;
0 0 .6;
1 1 0;
0 .8 0;
0 .6 .6;
0 0 0;
.3 0 .6;
.2 1 1;
1 .5 0;
.6 .2 1;
.2 1 .2;
0 .2 .4;
0 0 1;
.8 .8 .6];
handles = plotSpread(good_nets, 'categoryMarkers', {'x', '.'}, 'categoryLabels',↙
{'Permuted Differences','True Difference'}, 'distributionColors', rgb_for_plot',↙
'categoryIdx', net_inds, 'xNames', network_names)
rgb_for_plot = {};
for n = 1:numel(network_names)
rgb_for_plot{n} = rgb_colors(n,:);
end
handles = plotSpread(good_nets, 'categoryMarkers', {'x', '.'}, 'categoryLabels',↙
{'Permuted Differences','True Difference'}, 'distributionColors', rgb_for_plot',↙
'categoryIdx', net_inds, 'xNames', network_names)
scatter(1,perms_varSize(1,:), 'MarkerEdgeColor', 'red', 'MarkerFaceColor', 'red',↙
'SizeData', 50)
```

```
handles = plotSpread(good_nets, 'categoryMarkers', {'x', '.'}, 'categoryLabels',↙
{'Permuted Differences','True Difference'}, 'distributionColors', rgb_for_plot',↙
'categoryIdx', net_inds, 'xNames', network_names)
for n = 1:numel(network_names)
scatter(n,good_nets(1,n), 'MarkerEdgeColor', rgb_for_plot{1,n}, 'MarkerFaceColor',↙
rgb_for_plot{1,n}, 'SizeData', 50)
end
scatter([1:14],good_nets(1,:), 'MarkerEdgeColor', 'k', 'MarkerFaceColor', 'k',↙
'SizeData', 50)
scatter(6,good_nets(1,6), 'MarkerEdgeColor', 'w', 'MarkerFaceColor', 'w', 'SizeData', 50)
ylabel('Difference in Number of Variants')
xlabel('Assigned Network')
ax = gca;
ax.FontSize = 24;
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.7, 0.7]); %first and second↙
control position on screen, third controls width, and fourth controls height
axis([0, 15, -0.4, .7])
print(gcf, '/Users/dianaperez/Desktop/Thesis/Figures/Figure5_spreadPlot_networks_HCP.↙
jpg', '-dpng', '-r300')
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.9, 0.7]); %first and second↙
control position on screen, third controls width, and fourth controls height
print(gcf, '/Users/dianaperez/Desktop/Thesis/Figures/Figure5_spreadPlot_networks_HCP.↙
jpg', '-dpng', '-r300')
load('/Users/dianaperez/Desktop/Thesis/Variant_Properties/HCP384_new_split_networksxHem.↙
mat')
left_hem = networksxHem.clustersLH;
left_hem = [networksxHem.clustersLH(:,1:3) networksxHem.clustersLH(:,5) networksxHem.↙
clustersLH(:,7:end)];
right_hem = [networksxHem.clustersRH(:,1:3) networksxHem.clustersRH(:,5) networksxHem.↙
clustersRH(:,7:end)];
[h,mu,sigma,q,notch] = al_goodplot(leftHem,1:14,.2,[ 0    0.4470    0.7410],'left');
[h,mu,sigma,q,notch] = al_goodplot(rightHem,1:14,.2,[0.4660    0.6740↙
0.1880],'right');
[h,mu,sigma,q,notch] = al_goodplot(left_hem,1:14,.2,[ 0    0.4470    0.7410],'left');
rightHem = [networksxHem.clustersRH(:,1:3) networksxHem.clustersRH(:,5) networksxHem.↙
clustersRH(:,7:end)];
[h,mu,sigma,q,notch] = al_goodplot(rightHem,1:14,.2,[0.4660    0.6740↙
0.1880],'right');
axis([0, 15, -0.4, .7])
axis([0, 15, -0.1, 1])
8
axis([0, 15, -0.1, 8])
axis([0, 15, -0.1, 10])
5
axis([0, 15, -0.1, 15])
axis([0, 15, -0.1, 10])
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.9, 0.7]); %first and second↙
control position on screen, third controls width, and fourth controls height
load↙
('/Users/dianaperez/Desktop/Thesis/Spatial_Location/HCP/Handedness/LeftvsRightHanders_tru↙
e_spCorr_1000_permutations.mat')
load↙
('/Users/dianaperez/Desktop/Thesis/Spatial_Location/HCP/Handedness/PseudoRightvsPseudoLef↙
tHanders_spCorr_1000_permutations.mat')
clear all
load↙
('/Users/dianaperez/Desktop/Thesis/Spatial_Location/HCP/Handedness/LeftvsRightHanders_tru↙
e_spCorr_1000_permutations.mat')
load↙
('/Users/dianaperez/Desktop/Thesis/Spatial_Location/HCP/Handedness/PseudoRightvsPseudoLef↙
```

```
tHanders_spCorr_1000_permutations.mat')
scatter(500,true_spCorr, 'MarkerEdgeColor', 'red', 'MarkerFaceColor', 'red', 'SizeData',↙
200)
hold on
scatter(1:1000,spCorrs, 'MarkerEdgeColor', 'black', 'SizeData', 100)
axis([0, 1000, .65, 1])
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.3, 0.7]); %first and second↙
control position on screen, third controls width, and fourth controls height
ylabel('Correlation')
xticks([])
yticks([.65,.75,1])
ax = gca;
ax.FontSize = 24;
m = findobj(gca, 'Type', 'Scatter');
hleg1 = legend(m(1:2), 'Permuted Correlation Values', 'True Correlation', 'Location',↙
'SouthOutside');
hleg1.FontSize = 14;
hleg1.FontSize = 24;
scatter(500,true_spCorr, 'MarkerEdgeColor', 'red', 'MarkerFaceColor', 'red', 'SizeData',↙
200)
close gcf
scatter(1:1000,spCorrs, 'MarkerEdgeColor', 'black', 'SizeData', 100)
hold on
scatter(500,true_spCorr, 'MarkerEdgeColor', 'red', 'MarkerFaceColor', 'red', 'SizeData',↙
200)
axis([0, 1000, .65, 1])
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.3, 0.7]); %first and second↙
control position on screen, third controls width, and fourth controls height
ylabel('Correlation')
xticks([])
yticks([.65,.75,1])
ax = gca;
ax.FontSize = 24;
m = findobj(gca, 'Type', 'Scatter');
hleg1 = legend(m(1:2), 'Permuted Correlation Values', 'True Correlation', 'Location',↙
'SouthOutside');
hleg1.FontSize = 24;
print(gcf, '/Users/dianaperez/Desktop/Thesis/Figures/Figure5_spreadPlot_networks_HCP.↙
jpg', '-dpng', '-r300')
print(gcf,↙
'/Users/dianaperez/Desktop/Thesis/Figures/Figure6_perms_handedness_sptlLocation_HCP.jpg',↙
'-dpng', '-r300')
load↙
('/Users/dianaperez/Desktop/Thesis/Spatial_Location/HCP/VariantsvsFlippedVariants_allSubs↙
_true_spCorr_1000_thresh_10_permutations.mat')
load↙
('/Users/dianaperez/Desktop/Thesis/Spatial_Location/HCP/VariantsvsFlippedVariants_allSubs↙
_spCorr_1000_thresh_10_permutations.mat')
mean(spCorrs)
load('/Users/dianaperez/Desktop/Thesis/Variant_Properties/HCP384_new_split_variants_info.↙
mat')
clear all
load('/Users/dianaperez/Desktop/Thesis/Variant_Properties/HCP384_new_split_variants_info.↙
mat')
avgVarSize = variants_info.left_hem.group_avg{:,3};
mean(avgVarSize)
avgVarSize = variants_info.right_hem.group_avg{:,3};
mean(avgVarSize)
135.9740 - 115.7615
load↙
```

```
('/Users/dianaperez/Desktop/Thesis/Variant_Properties/Permutation_Tests/HCP384_LhemvsRhem↙
_var_size.mat')
true = output_mat(1,1);
perms = output_mat(2:end,1)
length(find(perms<true))
length(find(perms>true))
numVars = variants_info.left_hem.group_avg{:,1};
mean(numVars)
numVars = variants_info.right_hem.group_avg{:,1};
mean(numVars)
load↙
('/Users/dianaperez/Desktop/Thesis/Variant_Properties/Permutation_Tests/HCP384_LhemvsRhem↙
_num_vars.mat')
true = output_mat(1,1);
perms = output_mat(2:end,1);
length(find(perms<true))
length(find(perms>true))
2/1000
load↙
('/Users/dianaperez/Desktop/Thesis/Variant_Properties/Permutation_Tests/HCP384_LhemvsRhem↙
_num_border_shifts.mat')
LH = variants_info.left_hem.group_avg{:,4};
RH = variants_info.right_hem.group_avg{:,4};
mean(LH)
mean(RH)
true = output_mat(1,1);
perms = output_mat(2:end,1);
length(find(perms<true))
length(find(perms>true))
19/1000
LH = variants_info.left_hem.group_avg{:,5};
RH = variants_info.right_hem.group_avg{:,5};
mean(LH)
mean(RH)
load↙
('/Users/dianaperez/Desktop/Thesis/Variant_Properties/Permutation_Tests/HCP384_LhemvsRhem↙
_num_ectopic_ints.mat')
true = output_mat(1,1);
perms = output_mat(2:end,1);
length(find(perms<true))
length(find(perms>true))
44/1000
setpref('Internet', 'SMTP_Server', 'smtp.gmail.com')
setpref('Internet', 'E_Mail', 'sdianacperezrivera@gmail.com')
setpref('Internet', 'E_Mail', 'dianacperezrivera@gmail.com')
sendmail('dianacperezrivera@gmail.com', 'Hey Loser')
mail = 'dianacperezrivera@gmail.com';
password = 'cambrea1';
password = 'Cambrea1!';
server = 'smtp.gmail.com';
props = java.lang.System.getProperties;
props.setProperty('mail.smtp.port', '587');
props.setProperty('mail.smtp.auth','true');
props.setProperty('mail.smtp.starttls.enable','true');
setpref('Internet','E_mail', mail);
setpref('Internet','SMTP_Server', server);
setpref('Internet','SMTP_Username', mail);
setpref('Internet','SMTP_Password', password);
% Send the email
sendmail('receipient_email_address@example.com', 'Test', 'Msg from MATLAB');
```

```
mail = 'dianaperezrivera2024@u.northwestern.edu';
props = java.lang.System.getProperties;
props.setProperty('mail.smtp.port', '587');
props.setProperty('mail.smtp.auth','true');
props.setProperty('mail.smtp.starttls.enable','true');
setpref('Internet','E_mail', mail);
setpref('Internet','SMTP_Server', server);
setpref('Internet','SMTP_Username', mail);
setpref('Internet','SMTP_Password', password);
% Send the email
sendmail('dianacperezrivera@gmail.com', 'Test', 'Msg from MATLAB');
help system
BIDSify_deface
cd(nifti_path)
BIDSify_deface
cd ~
BIDSify_deface
[result, output] = system('dcm2bids')
addpath('/Users/dianaperez/opt/anaconda3/bin/dcm2bids')
[result, output] = system('dcm2bids')
setenv('PATH', [getenv('PATH') '/Users/dianaperez/opt/anaconda3/bin/dcm2bids']);
[result, output] = system('dcm2bids')
[result, output] = system('echo $PATH')
cd Documents/GitHub/Lateralization_Variants/
N = 5;
x = [randn(N,1); 100+randn(N,1)]; % 5 points toward the left of the plot, and 5 toward↙
the right
y = sort(randn(2*N,1));
% Scatter plot, and then connect each marker on the left
% to corresponding one on the right
figure
scatter(x,y)
line([x(1:N) x(N+1:end)]',[y(1:N) y(N+1:end)]')
help line
close gcf
load('/Users/dianaperez/Desktop/Thesis/Variant_Properties/HCP384_new_split_variants_info.↙
mat')
leftHem = variants_info.left_hem.group_avg{:,3};
rightHem = variants_info.right_hem.group_avg{:,3};
[h,mu,sigma,q,notch] = al_goodplot(leftHem,0,.2,[ 0    0.4470    0.7410],'left');
[h,mu,sigma,q,notch] = al_goodplot(rightHem,0,.2,[0.4660    0.6740    0.1880],'right');
xticks([0])
xticklabels('Average Variant Size')
axis([-0.4, 0.4, 50, 400])
ax = gca;
ax.FontSize = 24;
ylabel('Number of Vertices')
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.3, 0.7]); %first and second↙
control position on screen, third controls width, and fourth controls height
close gcf
[h,mu,sigma,q,notch] = al_goodplot(leftHem,0,.2,[ 0    0.4470    0.7410],'left');
[h,mu,sigma,q,notch] = al_goodplot(rightHem,0.2,.2,[0.4660    0.6740    0.1880],'right');
close gcf
[h,mu,sigma,q,notch] = al_goodplot(leftHem,0.1,.2,[ 0    0.4470    0.7410],'left');
[h,mu,sigma,q,notch] = al_goodplot(rightHem,0.2,.2,[0.4660    0.6740    0.1880],'right');
line(leftHem', rightHem')
line(leftHem, rightHem)
N = 184;
line([leftHem(1:N) leftHem(N+1:end)]',[rightHem(1:N) rightHem(N+1:end)]')
N = 5;
```

```
x = [randn(N,1); 100+randn(N,1)]; % 5 points toward the left of the plot, and 5 toward↙
the right
y = sort(randn(2*N,1));
% Scatter plot, and then connect each marker on the left
% to corresponding one on the right
figure
scatter(x,y)
line([x(1:N) x(N+1:end)]',[y(1:N) y(N+1:end)]')
randn(N,1)
help randn
100+randn(N,1)
y = sort(randn(2*N,1));
y = sort(randn(2*N,1))
[x(1:N) x(N+1:end)]'
[y(1:N) y(N+1:end)]'
close gcf
[h,mu,sigma,q,notch] = al_goodplot(leftHem,0.1,.2,[ 0    0.4470    0.7410],'left');
[h,mu,sigma,q,notch] = al_goodplot(rightHem,0.2,.2,[0.4660    0.6740    0.1880],'right');
y = zeros(384,2);
y(:,1) = 0.1;
y(:,2) = 0.2;
x(:,1) = leftHem;
x = [leftHem rightHem];
line([x(1:384) x(385:end)]',[y(1:384) y(385:end)]')
close gcf
[h,mu,sigma,q,notch] = al_goodplot(leftHem,0.1,.2,[ 0    0.4470    0.7410],'left');
[h,mu,sigma,q,notch] = al_goodplot(rightHem,0.2,.2,[0.4660    0.6740    0.1880],'right');
line(x',y')
x = x';
y = y';
z = y;
y = x;
x = z;
close gcf
[h,mu,sigma,q,notch] = al_goodplot(leftHem,0.1,.2,[ 0    0.4470    0.7410],'left');
[h,mu,sigma,q,notch] = al_goodplot(rightHem,0.2,.2,[0.4660    0.6740    0.1880],'right');
line(x,y)
clear all
load('/Users/dianaperez/Desktop/Thesis/Variant_Properties/HCP384_new_split_variants_info.↙
mat')
varID = variants_info.left_hem.indiv_vars{1,1};
LHem_numVarVerts = sum(variants_info.left_hem.indiv_vars{1,1});
varSize = variants_info.left_hem.indiv_vars{:,2};
LHem_numVarVerts = sum(variants_info.left_hem.indiv_vars{:,2});
length(variants_info.left_hem.indiv_vars)
height(variants_info.left_hem.indiv_vars)
variant_verts = [];
for var = 1:height(variants_info.left_hem.indiv_vars)
for sub = 1:384
sub_varVerts = [];
if variants_info.left_hem.indiv_vars{var,1} > variants_info.left_hem.indiv_vars{var+1,1}
sub_varVerts = [sub_varVerts + variants_info.left_hem.indiv_vars{var,2}];
else
variant_verts(sub) = sub_varVerts;
end
end
end
count_variant_vertices
variants_info.left_hem.indiv_vars{var,1}
count_variant_vertices
```

```
variants_info.left_hem.indiv_vars{var,2}
0 + variants_info.left_hem.indiv_vars{var,2}
count_variant_vertices
variants_info.left_hem.indiv_vars{var,1}
count_variant_vertices
varSize1 = variants_info.left_hem.indiv_vars{1:17,2};
sum(varSize1)
count_variant_vertices
variant_verts = variant_verts';
variant_verts(384,1) = sub_varVerts;
LH_variant_verts = variant_verts;
count_variant_vertices
RH_variant_verts = variant_verts;
variant_verts = [LH_variant_verts RH_variant_verts];
permute_variantproperties
mean(allSubs_info.variants_info.left_hem.group_avg{:,3})
mean(allSubs_info.variants_info.right_hem.group_avg{:,3})
mean(allSubs_info.variants_info.left_hem.group_avg{:,2})
mean(allSubs_info.variants_info.left_hem.group_avg{:,3})
mean(allSubs_info.variants_info.left_hem.group_avg{:,2})
mean(allSubs_info.variants_info.right_hem.group_avg{:,2})
%-- 9/18/21, 5:05 PM --%
operc_cluster
overlap_bin(vertex)
neigh_verts = neigh(vertex);
neigh_verts = neigh(:,vertex);
neigh_verts = neigh(vertex,:);
operc_cluster
neigh_verts = neigh(vertices(vert),:);
operc_cluster
vertices = unique(vertices);
for x=1:20
for vert = 1:length(vertices)
neigh_verts = neigh(vertices(vert),:);
for n = 1:length(neigh_verts)
if overlap_bin(neigh_verts(n)) == 1
vertices = [vertices; neigh_verts(n)];
end
end
end
vertices = unique(vertices);
end
vertices = unique(vertices);
neigh_verts(7)
if neigh_verts(7)==NaN
disp('hello')
end
maybe_mask = vertices;
operc_cluster
help isnan
operc_cluster
vertices = unique(vertices);
operc_cluster
maybe_maybe_mask = vertices;
operc_mask(vertices) = 1;
template = overlap;
template.data = operc_mask;
ft_write_cifti_mod('Users/dianaperez/Desktop/operc_mask_v1.dtseries.nii', template)
ft_write_cifti_mod('/Users/dianaperez/Desktop/operc_mask_v1.dtseries.nii', template)
operc_mask(maybe_maybe_mask) = 1;
```

```
template.data = operc_mask;
ft_write_cifti_mod('/Users/dianaperez/Desktop/operc_mask_v2_20_iterations.dtseries.nii',↙
template)
operc_mask(vertices) = 1;
template.data = operc_mask;
ft_write_cifti_mod('/Users/dianaperez/Desktop/operc_mask_v2_30_iterations.dtseries.nii',↙
template)
operc_mask(maybe_mask) = 1;
template.data = operc_mask;
ft_write_cifti_mod('/Users/dianaperez/Desktop/operc_mask_v1.dtseries.nii', template)
operc_mask(maybe_mask) = 1;
template.data = operc_mask;
ft_write_cifti_mod('/Users/dianaperez/Desktop/operc_mask_v1_958_verts.dtseries.nii',↙
template)
operc_mask = zeros(numVerts,1);
operc_mask(maybe_mask) = 1;
template.data = operc_mask;
ft_write_cifti_mod('/Users/dianaperez/Desktop/operc_mask_v1_958_verts.dtseries.nii',↙
template)
operc_mask = zeros(numVerts,1);
operc_mask(maybe_maybe_mask) = 1;
template.data = operc_mask;
ft_write_cifti_mod('/Users/dianaperez/Desktop/operc_mask_v2_1113_verts.dtseries.nii',↙
template)
operc_mask = zeros(numVerts,1);
operc_mask(vertices) = 1;
template.data = operc_mask;
ft_write_cifti_mod('/Users/dianaperez/Desktop/operc_mask_v3_1889_verts.dtseries.nii',↙
template)
operc_cluster
operc_mask = zeros(numVerts,1);
operc_mask(vertices) = 1;
template.data = operc_mask;
ft_write_cifti_mod('/Users/dianaperez/Desktop/operc_mask_v4.dtseries.nii', template)
operc_cluster
operc_mask = zeros(numVerts,1);
operc_mask(vertices) = 1;
template.data = operc_mask;
ft_write_cifti_mod('/Users/dianaperez/Desktop/operc_mask_v5.dtseries.nii', template)
operc_cluster
operc_mask = zeros(numVerts,1);
operc_mask(vertices) = 1;
template.data = operc_mask;
ft_write_cifti_mod('/Users/dianaperez/Desktop/operc_mask_v6.dtseries.nii', template)
operc_cluster
ft_write_cifti_mod('/Users/dianaperez/Desktop/operc_mask_moreRHvars.dtseries.nii',↙
template)
operc_cluster
if unique_IDs(1) == 0
unique_IDs(1) = [];
end
operc_cluster
find(var_map.data==sub_data(var,1));
operc_cluster
LH_cluster = [];
LH_cluster.number = LH_cluster_number;
LH_cluster.proportion = LH_cluster_proportion;
save([output_dir 'operc_nets_lefthemcluster.mat'], 'LH_cluster')
output_dir = '/Users/dianaperez/Desktop';
save([output_dir 'operc_nets_lefthemcluster.mat'], 'LH_cluster')
```

```
RH_cluster = [];
RH_cluster.number = RH_cluster_number;
RH_cluster.proportion = RH_cluster_proportion;
save([output_dir 'operc_nets_righthemcluster.mat'], 'RH_cluster')
operc_cluster
RH_mask_flipped = [RH_mask_gifti(32493:end); RH_mask_gifti(1:32492)];
LH_mask_flipped = [LH_mask_gifti(32493:end); LH_mask_gifti(1:32492)];
RH_mask_flipped = [RH_mask_gifti(32493:end); RH_mask_gifti(1:32492)];
LH_mask_flipped = [LH_mask_gifti(32493:end); LH_mask_gifti(1:32492)];
RH_mask_flipped = RH_mask_flipped(diffmap.brainstructure>0);
LH_mask_flipped = LH_mask_flipped(diffmap.brainstructure>0);
operc_cluster
load([output_dir 'operc_nets_lefthemcluster_righthem.mat'];
load([output_dir 'operc_nets_lefthemcluster_righthem.mat']);
clear all
load([output_dir 'operc_nets_lefthemcluster_righthem.mat']);
output_dir = '/Users/dianaperez/Desktop/Thesis/Spatial_Location/';
load([output_dir 'operc_nets_lefthemcluster_righthem.mat']);
leftclust_righthem = LH_cluster;
load([output_dir 'operc_nets_lefthemcluster_lefthem.mat']);
leftclust_lefthem = LH_cluster;
clear LH_cluster
t = tiledlayout(1,2,'TileSpacing', 'compact');
ax1 = nexttile;
pie(ax1,leftclust_lefthem)
title('Left Hem')
pie(ax1,leftclust_lefthem.number)
title('Left Hem')
pie(ax1,leftclust_lefthem.number{:,3})
number = leftclust_lefthem.number{1,3}
number = leftclust_lefthem.number(:,3);
close gcf
t = tiledlayout(1,2,'TileSpacing', 'compact');
ax1 = nexttile;
pie(ax1,leftclust_lefthem.number(:,3))
title('Left Hem')
close gcf
for net = 1:16
nets(net) = length(find(leftclust_lefthem.number(:,3)==net));
end
t = tiledlayout(1,2,'TileSpacing', 'compact');
ax1 = nexttile;
pie(ax1,nets)
title('Left Hem')
for net = 1:16
nets_right(net) = length(find(leftclust_righthem.number(:,3)==net));
end
ax2 = nexttile;
pie(ax2,nets_right)
title('Right Hem')
ax = gca;
clear all
rgb_colors = [1 0 0;
0 0 .6;
1 1 0;
0 .8 0;
0 .6 .6;
0 0 0;
.3 0 .6;
.2 1 1;
```

```
1 .5 0;
.6 .2 1;
.2 1 .2;
0 .2 .4;
0 0 1;
.8 .8 .6];
load([output_dir 'operc_nets_lefthemcluster_righthem.mat']);
leftclust_righthem = LH_cluster;
load([output_dir 'operc_nets_lefthemcluster_lefthem.mat']);
leftclust_lefthem = LH_cluster;
clear LH_cluster
for net = 1:16
nets_left(net) = length(find(leftclust_lefthem.number(:,3)==net));
end
nets_left(4) = [];
nets_left(6) = [];
t = tiledlayout(1,2,'TileSpacing', 'compact');
ax1 = nexttile;
h = pie(ax1,nets_left)
title('Left Hem')
for net = 1:16
nets_right(net) = length(find(leftclust_righthem.number(:,3)==net));
end
nets_right(4) = [];
nets_right(6) = [];
ax2 = nexttile;
h = pie(ax2,nets_right)
title('Right Hem')
output_dir = '/Users/dianaperez/Desktop/Thesis/Spatial_Location/';
load([output_dir 'operc_nets_lefthemcluster_righthem.mat']);
leftclust_righthem = LH_cluster;
load([output_dir 'operc_nets_lefthemcluster_lefthem.mat']);
leftclust_lefthem = LH_cluster;
clear LH_cluster
for net = 1:16
nets_left(net) = length(find(leftclust_lefthem.number(:,3)==net));
end
nets_left(4) = [];
nets_left(6) = [];
t = tiledlayout(1,2,'TileSpacing', 'compact');
ax1 = nexttile;
h = pie(ax1,nets_left)
title('Left Hem')
for net = 1:16
nets_right(net) = length(find(leftclust_righthem.number(:,3)==net));
end
nets_right(4) = [];
nets_right(6) = [];
ax2 = nexttile;
h = pie(ax2,nets_right)
title('Right Hem')
patchHande = findobj(h, 'Type', 'Patch');
set(pathHand, {'FaceColor'}, mat2cell(rgb_colors, ones(size(rgb_colors,1),1),3)
set(patchHande, {'FaceColor'}, mat2cell(rgb_colors, ones(size(rgb_colors,1),1),3))
close gcf
output_dir = '/Users/dianaperez/Desktop/Thesis/Spatial_Location/';
load([output_dir 'operc_nets_lefthemcluster_righthem.mat']);
leftclust_righthem = LH_cluster;
load([output_dir 'operc_nets_lefthemcluster_lefthem.mat']);
leftclust_lefthem = LH_cluster;
```

```
clear LH_cluster
for net = 1:16
nets_left(net) = length(find(leftclust_lefthem.number(:,3)==net));
end
nets_left(4) = [];
nets_left(6) = [];
t = tiledlayout(1,2,'TileSpacing', 'compact');
ax1 = nexttile;
h = pie(ax1,nets_left);
title('Left Hem')
patchHandle = findobj(h, 'Type', 'Patch');
set(patchHandle, {'FaceColor'}, mat2cell(rgb_colors, ones(size(rgb_colors,1),1),3))
for net = 1:16
nets_right(net) = length(find(leftclust_righthem.number(:,3)==net));
end
nets_right(4) = [];
nets_right(6) = [];
ax2 = nexttile;
h = pie(ax2,nets_right);
title('Right Hem')
patchHandle = findobj(h, 'Type', 'Patch');
set(patchHandle, {'FaceColor'}, mat2cell(rgb_colors, ones(size(rgb_colors,1),1),3))
for net = 1:16
nets_left(net) = length(find(leftclust_lefthem.number(:,3)==net));
end
nets_left(6) = [];
nets_left(4) = [];
t = tiledlayout(1,2,'TileSpacing', 'compact');
ax1 = nexttile;
h = pie(ax1,nets_left);
title('Left Hem')
patchHandle = findobj(h, 'Type', 'Patch');
set(patchHandle, {'FaceColor'}, mat2cell(rgb_colors, ones(size(rgb_colors,1),1),3))
%network_names = {'DMN' 'Vis' 'FP' 'DAN' 'Lang' 'Sal'   'CO'    'SMd'   'SMl'   'Aud'};
for net = 1:16
nets_right(net) = length(find(leftclust_righthem.number(:,3)==net));
end
nets_right(6) = [];
nets_right(4) = [];
ax2 = nexttile;
h = pie(ax2,nets_right);
title('Right Hem')
patchHandle = findobj(h, 'Type', 'Patch');
set(patchHandle, {'FaceColor'}, mat2cell(rgb_colors, ones(size(rgb_colors,1),1),3))
close gcf
rgb_colors = [1 0 0;
1 1 0;
0 .8 0;
0 .6 .6;
0 0 0;
.3 0 .6;
1 .5 0;];
output_dir = '/Users/dianaperez/Desktop/Thesis/Spatial_Location/';
load([output_dir 'operc_nets_lefthemcluster_righthem.mat']);
leftclust_righthem = LH_cluster;
load([output_dir 'operc_nets_lefthemcluster_lefthem.mat']);
leftclust_lefthem = LH_cluster;
clear LH_cluster
for net = 1:16
nets_left(net) = length(find(leftclust_lefthem.number(:,3)==net));
```

```
end
nets_left(6) = [];
nets_left(4) = [];
t = tiledlayout(1,2,'TileSpacing', 'compact');
ax1 = nexttile;
h = pie(ax1,nets_left, network_names);
title('Left Hem')
patchHandle = findobj(h, 'Type', 'Patch');
set(patchHandle, {'FaceColor'}, mat2cell(rgb_colors, ones(size(rgb_colors,1),1),3))
network_names = {'DMN'  'FP' 'DAN' 'Lang'   'Sal'   'CO'    'SMl'};
for net = 1:16
nets_right(net) = length(find(leftclust_righthem.number(:,3)==net));
end
nets_right(6) = [];
nets_right(4) = [];
ax2 = nexttile;
h = pie(ax2,nets_right, network_names);
title('Right Hem')
patchHandle = findobj(h, 'Type', 'Patch');
set(patchHandle, {'FaceColor'}, mat2cell(rgb_colors, ones(size(rgb_colors,1),1),3))
labels_legend = {'Default Mode' 'Frontoparietal', 'Dorsal Attention', 'Language',↙
'Salience', 'Cingulo-opercular',  'Somatomotor lateral'};
lgd = legend(labels_legend);
lgd.Layout.Tile = 'east';
rgb_colors = [1 0 0;
1 1 0;
0 .8 0;
0 .6 .6;
0 0 0;
.3 0 .6;
1 .5 0;];
output_dir = '/Users/dianaperez/Desktop/Thesis/Spatial_Location/';
load([output_dir 'operc_nets_lefthemcluster_righthem.mat']);
leftclust_righthem = LH_cluster;
load([output_dir 'operc_nets_lefthemcluster_lefthem.mat']);
leftclust_lefthem = LH_cluster;
clear LH_cluster
network_names = {'DMN'  'FP' 'DAN' 'Lang'   'Sal'   'CO'    'SMl'};
for net = 1:16
nets_left(net) = length(find(leftclust_lefthem.number(:,3)==net));
end
nets_left(6) = [];
nets_left(4) = [];
t = tiledlayout(1,2,'TileSpacing', 'compact');
ax1 = nexttile;
h = pie(ax1,nets_left, network_names);
title('Left Hem')
patchHandle = findobj(h, 'Type', 'Patch');
set(patchHandle, {'FaceColor'}, mat2cell(rgb_colors, ones(size(rgb_colors,1),1),3))
for net = 1:16
nets_right(net) = length(find(leftclust_righthem.number(:,3)==net));
end
nets_right(6) = [];
nets_right(4) = [];
ax2 = nexttile;
h = pie(ax2,nets_right, network_names);
title('Right Hem')
patchHandle = findobj(h, 'Type', 'Patch');
set(patchHandle, {'FaceColor'}, mat2cell(rgb_colors, ones(size(rgb_colors,1),1),3))
labels_legend = {'Default Mode' 'Frontoparietal', 'Dorsal Attention', 'Language',↙
```

```
'Salience', 'Cingulo-opercular',  'Somatomotor lateral'};
lgd = legend(labels_legend);
lgd.Layout.Tile = 'east';
rgb_colors = [1 0 0;
1 1 0;
0 .8 0;
0 .6 .6;
0 0 0;
.3 0 .6;
1 .5 0;];
output_dir = '/Users/dianaperez/Desktop/Thesis/Spatial_Location/';
load([output_dir 'operc_nets_lefthemcluster_righthem.mat']);
leftclust_righthem = LH_cluster;
load([output_dir 'operc_nets_lefthemcluster_lefthem.mat']);
leftclust_lefthem = LH_cluster;
clear LH_cluster
network_names = {'DMN'  'FP' 'DAN' 'Lang'   'Sal'   'CO'    'SMl'};
for net = 1:16
nets_left(net) = length(find(leftclust_lefthem.number(:,3)==net));
end
nets_left(10:end) = [];
nets_left(8) = [];
nets_left(6) = [];
nets_left(4) = [];
nets_left(2) = [];
t = tiledlayout(1,2,'TileSpacing', 'compact');
ax1 = nexttile;
h = pie(ax1,nets_left, network_names);
title('Left Hem')
patchHandle = findobj(h, 'Type', 'Patch');
set(patchHandle, {'FaceColor'}, mat2cell(rgb_colors, ones(size(rgb_colors,1),1),3))
for net = 1:16
nets_right(net) = length(find(leftclust_righthem.number(:,3)==net));
end
nets_right(10:end) = [];
nets_right(8) = [];
nets_right(6) = [];
nets_right(4) = [];
nets_right(2) = [];
ax2 = nexttile;
h = pie(ax2,nets_right, network_names);
title('Right Hem')
patchHandle = findobj(h, 'Type', 'Patch');
set(patchHandle, {'FaceColor'}, mat2cell(rgb_colors, ones(size(rgb_colors,1),1),3))
labels_legend = {'Default Mode' 'Frontoparietal', 'Dorsal Attention', 'Language',↙
'Salience', 'Cingulo-opercular',  'Somatomotor lateral'};
lgd = legend(labels_legend);
lgd.Layout.Tile = 'east';
for net = 1:16
nets_left(net) = length(find(leftclust_lefthem.number(:,3)==net));
end
for net = 1:16
nets_right(net) = length(find(leftclust_righthem.number(:,3)==net));
end
nets_left(6) = [];
nets_left(4) = [];
nets_right(6) = [];
nets_right(4) = [];
nets_left(10:end) = [];
nets_right(10:end) = [];
```

```
nets_left(8) = [];
nets_right(8) = [];
nets_left(2) = [];
nets_right(2) = [];
t = tiledlayout(1,2,'TileSpacing', 'compact');
ax1 = nexttile;
h = pie(ax1,nets_left, network_names);
title('Left Hem')
patchHandle = findobj(h, 'Type', 'Patch');
set(patchHandle, {'FaceColor'}, mat2cell(rgb_colors, ones(size(rgb_colors,1),1),3))
h = pie(ax2,nets_right, network_names);
title('Right Hem')
patchHandle = findobj(h, 'Type', 'Patch');
set(patchHandle, {'FaceColor'}, mat2cell(rgb_colors, ones(size(rgb_colors,1),1),3))
labels_legend = {'Default Mode' 'Frontoparietal', 'Dorsal Attention', 'Language',↙
'Salience', 'Cingulo-opercular',  'Somatomotor lateral'};
lgd = legend(labels_legend);
lgd.Layout.Tile = 'east';
close gcf
rgb_colors = [1 0 0;
1 1 0;
0 .8 0;
0 .6 .6;
0 0 0;
.3 0 .6;
1 .5 0;];
output_dir = '/Users/dianaperez/Desktop/Thesis/Spatial_Location/';
load([output_dir 'operc_nets_lefthemcluster_righthem.mat']);
leftclust_righthem = LH_cluster;
load([output_dir 'operc_nets_lefthemcluster_lefthem.mat']);
leftclust_lefthem = LH_cluster;
clear LH_cluster
network_names = {'DMN'  'FP' 'DAN' 'Lang'   'Sal'   'CO'    'SMl'};
for net = 1:16
nets_left(net) = length(find(leftclust_lefthem.number(:,3)==net));
end
nets_left(6) = [];
nets_left(4) = [];
nets_left(10:end) = [];
nets_left(8) = [];
nets_left(2) = [];
t = tiledlayout(1,2,'TileSpacing', 'compact');
ax1 = nexttile;
h = pie(ax1,nets_left, network_names);
title('Left Hem')
patchHandle = findobj(h, 'Type', 'Patch');
set(patchHandle, {'FaceColor'}, mat2cell(rgb_colors, ones(size(rgb_colors,1),1),3))
for net = 1:16
nets_right(net) = length(find(leftclust_righthem.number(:,3)==net));
end
nets_right(6) = [];
nets_right(4) = [];
nets_right(10:end) = [];
nets_right(8) = [];
nets_right(2) = [];
ax2 = nexttile;
h = pie(ax2,nets_right, network_names);
title('Right Hem')
patchHandle = findobj(h, 'Type', 'Patch');
set(patchHandle, {'FaceColor'}, mat2cell(rgb_colors, ones(size(rgb_colors,1),1),3))
```

```
labels_legend = {'Default Mode' 'Frontoparietal', 'Dorsal Attention', 'Language',↙
'Salience', 'Cingulo-opercular',  'Somatomotor lateral'};
lgd = legend(labels_legend);
lgd.Layout.Tile = 'east';
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.9, 0.7]); %first and second↙
control position on screen, third controls width, and fourth controls height
ax1.FontSize = 24;
ax2.FontSize = 24;
h.FontSize = 21
lgd.FontSize = 21
lgd.FontSize = 24
print(gcf,↙
'/Users/dianaperez/Desktop/Thesis/Figures/Figure7_pieChart_operc_cluster_networks_lefthem↙
_HCP.jpg', '-dpng', '-r300')
output_dir = '/Users/dianaperez/Desktop/Thesis/Spatial_Location/';
load([output_dir 'operc_nets_righthemcluster_righthem.mat']);
leftclust_righthem = LH_cluster;
load([output_dir 'operc_nets_righthemcluster_lefthem.mat']);
leftclust_lefthem = LH_cluster;
clear LH_cluster
leftclust_righthem = RH_cluster;
output_dir = '/Users/dianaperez/Desktop/Thesis/Spatial_Location/';
load([output_dir 'operc_nets_righthemcluster_righthem.mat']);
leftclust_righthem = RH_cluster;
load([output_dir 'operc_nets_righthemcluster_lefthem.mat']);
leftclust_lefthem = RH_cluster;
clear RH_cluster
clear all
rgb_colors = [1 0 0;
1 1 0;
0 .8 0;
0 .6 .6;
0 0 0;
.3 0 .6;
1 .5 0;];
output_dir = '/Users/dianaperez/Desktop/Thesis/Spatial_Location/';
load([output_dir 'operc_nets_righthemcluster_righthem.mat']);
rightclust_righthem = RH_cluster;
load([output_dir 'operc_nets_righthemcluster_lefthem.mat']);
rightclust_lefthem = RH_cluster;
clear RH_cluster
for net = 1:16
nets_left(net) = length(find(rightclust_lefthem.number(:,3)==net));
end
nets_left(6) = [];
nets_left(4) = [];
for net = 1:16
nets_right(net) = length(find(leftclust_righthem.number(:,3)==net));
end
for net = 1:16
nets_right(net) = length(find(rightclust_righthem.number(:,3)==net));
end
nets_right(6) = [];
nets_right(4) = [];
clear all
rgb_colors = [1 0 0;
1 1 0;
0 .8 0;
0 .6 .6;
0 0 0;
```

```
.3 0 .6;
1 .5 0;
.8 .8 .6;];
output_dir = '/Users/dianaperez/Desktop/Thesis/Spatial_Location/';
load([output_dir 'operc_nets_righthemcluster_righthem.mat']);
rightclust_righthem = RH_cluster;
load([output_dir 'operc_nets_righthemcluster_lefthem.mat']);
rightclust_lefthem = RH_cluster;
clear RH_cluster
network_names = {'DMN'  'FP' 'DAN' 'Lang'   'Sal'   'CO'    'SMl' 'PON'};
for net = 1:16
nets_left(net) = length(find(rightclust_lefthem.number(:,3)==net));
end
nets_left(6) = [];
nets_left(4) = [];
nets_left(10:13) = [];
nets_left(8) = [];
nets_left(2) = [];
t = tiledlayout(1,2,'TileSpacing', 'compact');
ax1 = nexttile;
h = pie(ax1,nets_left, network_names);
title('Left Hem')
patchHandle = findobj(h, 'Type', 'Patch');
set(patchHandle, {'FaceColor'}, mat2cell(rgb_colors, ones(size(rgb_colors,1),1),3))
for net = 1:16
nets_right(net) = length(find(rightclust_righthem.number(:,3)==net));
end
nets_right(6) = [];
nets_right(4) = [];
nets_right(10:13) = [];
nets_right(8) = [];
nets_right(2) = [];
ax2 = nexttile;
h = pie(ax2,nets_right, network_names);
title('Right Hem')
patchHandle = findobj(h, 'Type', 'Patch');
set(patchHandle, {'FaceColor'}, mat2cell(rgb_colors, ones(size(rgb_colors,1),1),3))
labels_legend = {'Default Mode' 'Frontoparietal', 'Dorsal Attention', 'Language',↙
'Salience', 'Cingulo-Opercular',  'Somatomotor Ventral' 'Parieto-Occipital'};
lgd = legend(labels_legend);
lgd.Layout.Tile = 'east';
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.9, 0.7]); %first and second↙
control position on screen, third controls width, and fourth controls height
ax1.FontSize = 24;
ax2.FontSize = 24;
lgd.FontSize = 24;
print(gcf,↙
'/Users/dianaperez/Desktop/Thesis/Figures/Figure7_pieChart_operc_cluster_networks_righthe↙
m_HCP.jpg', '-dpng', '-r300')
%-- 9/20/21, 7:08 PM --%
load('/Users/dianaperez/Desktop/Thesis/Variant_Properties/HCP384_new_split_networksxHem.↙
mat')
network_names = {'DMN'  'Vis'   'FP'    ' ' 'DAN'   ' ' 'VAN'   'Sal'   'CO'    'SMd'↙
'SMl'   'Aud'   'Tpole' 'MTL'   'PMN'   'PON'};
%network_names = {'DMN' 'Vis'   'FP'    'DAN'   'VAN'   'Sal'   'CO'    'SMd'   'SMl'↙
'Aud'   'Tpole' 'MTL'   'PMN'   'PON'};
results = [];
statistics = [];
for net = 1:numel(network_names)
left_hemi = networksxHem.clustersLH(:,net);
```

```
right_hemi = networksxHem.clustersRH(:,net);
results(net,1) = mean(left_hemi);
results(net,2) = mean(right_hemi);
[sig p ci stats] = ttest(left_hemi, right_hemi);
results(net,3) = sig;
results(net,4) = p;
statistics{net} = stats;
end
get(gca, 'ColorOrder')
load('/Users/dianaperez/Desktop/Thesis/Variant_Properties/HCP384_new_split_variants_info.↙
mat')
numVarsLH = variants_info.left_hem.group_avg{:,1};
numVarsRH = variants_info.right_hem.group_avg{:,1};
numBorderLH = variants_info.left_hem.group_avg{:,4};
numBorderRH = variants_info.right_hem.group_avg{:,4};
numEctopicLH = variants_info.left_hem.group_avg{:,5};
numEctopicRH = variants_info.right_hem.group_avg{:,5};
leftHem = [numVarsLH numBorderLH numEctopicLH];
rightHem = [numVarsRH numBorderRH numEctopicRH];
[h,mu,sigma,q,notch] = al_goodplot(leftHem,[-1,0,1],.2,[ 0    0.4470    0.7410],'left');
[h,mu,sigma,q,notch] = al_goodplot(rightHem,[-1,0,1],.2,[0.8500    0.3250↙
0.0980],'right');
ax = gca;
ax.FontSize = 24;
ylabel('Number of Variants')
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.5, 0.7]); %first and second↙
control position on screen, third controls width, and fourth controls height
xticklabels({'All Variants', 'Border Shifts', 'Ectopic Intrusions'})
xticks([-1,0,1])
m = findobj(gca, 'Type', 'Scatter')
hleg1 = legend(m(1:2), 'Right Hemisphere', 'Left Hemisphere', 'Location',↙
'SouthOutside');
print(gcf,↙
'/Users/dianaperez/Desktop/Thesis/Figures/Figure2_violin_numVarsBorderEctopic_HCP.jpg',↙
'-dpng', '-r300')
load('/Users/dianaperez/Desktop/Thesis/Variant_Properties/HCP384_new_split_variants_info.↙
mat')
leftHem = variants_info.left_hem.group_avg{:,3};
rightHem = variants_info.right_hem.group_avg{:,3};
[h,mu,sigma,q,notch] = al_goodplot(leftHem,0.1,.2,[ 0    0.4470    0.7410],'left');
[h,mu,sigma,q,notch] = al_goodplot(rightHem,0.2,.2,[0.8500    0.3250    0.0980],'right');
xticks([0])
xticklabels('Average Variant Size')
axis([-0.4, 0.4, 50, 400])
ax = gca;
ax.FontSize = 24;
ylabel('Number of Vertices')
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.3, 0.7]); %first and second↙
control position on screen, third controls width, and fourth controls height
%m = findobj(gca, 'Type', 'Scatter');
%hleg1 = legend(m(1:2), 'Right Hemisphere', 'Left Hemisphere', 'Location',↙
'SouthOutside');
print(gcf, '/Users/dianaperez/Desktop/Thesis/Figures/Figure2_violin_avgVarSize_HCP.jpg',↙
'-dpng', '-r300')
load('/Users/dianaperez/Desktop/Thesis/Variant_Properties/HCP384_new_split_variants_info.↙
mat')
leftHem = variants_info.left_hem.group_avg{:,3};
rightHem = variants_info.right_hem.group_avg{:,3};
[h,mu,sigma,q,notch] = al_goodplot(leftHem,0.1,.2,[ 0    0.4470    0.7410],'left');
[h,mu,sigma,q,notch] = al_goodplot(rightHem,0.2,.2,[0.8500    0.3250    0.0980],'right');
```

```
xticks([0])
xticklabels('Average Variant Size')
axis([-0.2, 0.5, 50, 400])
ax = gca;
ax.FontSize = 24;
ylabel('Number of Vertices')
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.3, 0.7]); %first and second↙
control position on screen, third controls width, and fourth controls height
%m = findobj(gca, 'Type', 'Scatter');
%hleg1 = legend(m(1:2), 'Right Hemisphere', 'Left Hemisphere', 'Location',↙
'SouthOutside');
print(gcf, '/Users/dianaperez/Desktop/Thesis/Figures/Figure2_violin_avgVarSize_HCP.jpg',↙
'-dpng', '-r300')
load('/Users/dianaperez/Desktop/Thesis/Variant_Properties/HCP384_new_split_variants_info.↙
mat')
leftHem = variants_info.left_hem.group_avg{:,3};
rightHem = variants_info.right_hem.group_avg{:,3};
[h,mu,sigma,q,notch] = al_goodplot(leftHem,0.1,.2,[ 0    0.4470    0.7410],'left');
[h,mu,sigma,q,notch] = al_goodplot(rightHem,0.2,.2,[0.8500    0.3250    0.0980],'right');
xticks([0])
xticklabels('Average Variant Size')
axis([-0.2, 0.5, 50, 400])
ax = gca;
ax.FontSize = 24;
ylabel('Number of Vertices')
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.3, 0.7]); %first and second↙
control position on screen, third controls width, and fourth controls height
m = findobj(gca, 'Type', 'Scatter');
hleg1 = legend(m(1:2), 'Right Hemisphere', 'Left Hemisphere', 'Location',↙
'SouthOutside');
print(gcf, '/Users/dianaperez/Desktop/Thesis/Figures/Figure2_violin_avgVarSize_HCP.jpg',↙
'-dpng', '-r300')
%-- 10/2/21, 7:40 PM --%
permute_variantproperties
avgSurfArea = allSubs_info.variants_info.left_hem.group_avg{:,4};
mean(avgSurfArea)
avgSurfArea = allSubs_info.variants_info.right_hem.group_avg{:,4};
mean(avgSurfArea)
[true_diff perm_diffs] = permute_values(LHand_info.variants_info.both_hems{:,4},↙
RHand_info.variants_info.both_hems{:,4}, flip_switch, numperms, 1, 0, 1);
[true_diff perm_diffs] = permute_values(allSubs_info.variants_info.left_hem.group_avg{:,↙
4}, allSubs_info.variants_info.right_hem.group_avg{:,4}, flip_switch, numperms, 0, 1, 0);
disp(['Average variant surface area (permute hemispheres) - Below: ' num2str(length(find↙
(perm_diffs<true_diff))/1000)])
disp(['Average variant surface area (permute hemispheres) - Above: ' num2str(length(find↙
(perm_diffs>true_diff))/1000)])
output_mat = [true_diff; perm_diffs'];
save([outputDir str 'avgSurfArea.mat'], 'output_mat'); clear output_mat
5:3
1:2
3:5
3/5
10/7
left_hem_ratio = allSubs_info.variants_info.left_hem.group_avg{:,5}./allSubs_info.↙
variants_info.left_hem.group_avg{:,7};
right_hem_ratio = allSubs_info.variants_info.right_hem.group_avg{:,5}./allSubs_info.↙
variants_info.right_hem.group_avg{:,7};
[true_diff perm_diffs] = permute_values(left_hem_ratio, right_hem_ratio, flip_switch,↙
numperms, 0, 1, 0);
disp(['Border:Ectopic Ratio (permute hemispheres) - Below: ' num2str(length(find↙
```

```
(perm_diffs<true_diff))/1000)])
disp(['Border:Ectopic Ratio (permute hemispheres) - Above: ' num2str(length(find↙
(perm_diffs>true_diff))/1000)])
output_mat = [true_diff; perm_diffs'];
save([outputDir str 'border_ectopic_ratio.mat'], 'output_mat'); clear output_mat
mean(left_hem_ratio)
mean(right_hem_ratio)
network_names = {'DMN'  'Vis'   'FP'    ' ' 'DAN'   ' ' 'VAN'   'Sal'   'CO'    'SMd'↙
'SMl'   'Aud'   'Tpole' 'MTL'   'PMN'   'PON'};
%network_names = {'DMN' 'Vis'   'FP'    'DAN'   'VAN'   'Sal'   'CO'    'SMd'   'SMl'↙
'Aud'   'Tpole' 'MTL'   'PMN'   'PON'};
results = [];
statistics = [];
for net = 1:numel(network_names)
left_hemi = networksxHem.clustersLH(:,net);
right_hemi = networksxHem.clustersRH(:,net);
results(net,1) = mean(left_hemi);
results(net,2) = mean(right_hemi);
[sig p ci stats] = ttest(left_hemi, right_hemi);
results(net,3) = sig;
results(net,4) = p;
statistics{net} = stats;
end
load([rootDir str '_networksxHem.mat']);
str = 'HCP384_new_split';
load([rootDir str '_networksxHem.mat']);
network_names = {'DMN'  'Vis'   'FP'    ' ' 'DAN'   ' ' 'VAN'   'Sal'   'CO'    'SMd'↙
'SMl'   'Aud'   'Tpole' 'MTL'   'PMN'   'PON'};
%network_names = {'DMN' 'Vis'   'FP'    'DAN'   'VAN'   'Sal'   'CO'    'SMd'   'SMl'↙
'Aud'   'Tpole' 'MTL'   'PMN'   'PON'};
results = [];
statistics = [];
for net = 1:numel(network_names)
left_hemi = networksxHem.clustersLH(:,net);
right_hemi = networksxHem.clustersRH(:,net);
results(net,1) = mean(left_hemi);
results(net,2) = mean(right_hemi);
[sig p ci stats] = ttest(left_hemi, right_hemi);
results(net,3) = sig;
results(net,4) = p;
statistics{net} = stats;
end
p_vals = ~isnan(results(:,4));
p_vals = results(~isnan(results(:,4)),4);
p_vals = [p_vals; 0.001; 0.002; 0.001; 0.14; 0.02; 0.05; 0.001; 0.001];
[p_fdr, p_masked] = FDR(p_vals, .05);
p_masked(1,2) = 'DMN';
%-- 10/4/21, 11:29 AM --%
check_MRI_data
%-- 10/6/21, 10:57 AM --%
load↙
('/Users/dianaperez/Desktop/Thesis/Variant_Properties/HCP384_new_split_variants_info_wSur↙
fArea.mat')
proportionBorders = variants_info.left_hem.group_avg{:,6};
proportionBorders1 = variants_info.left_hem.group_avg{:,6};
proportionEctopics = variants_info.left_hem.group_avg{:,8};
mean(proportionBorders)
mean(proportionEctopics)
proportionBorders = variants_info.right_hem.group_avg{:,6};
mean(proportionBorders)
```

```
permute_handedness
load↙
('/Users/dianaperez/Desktop/Thesis/Variant_Properties/HCP384_new_split_variants_info_wSur↙
fArea.mat')
border_LHem = variants_info.left_hem.indiv_vars(variants_info.left_hem.indiv_vars{:,5}↙
==1);
bord_ectop = variants_info.left_hem.indiv_vars{:,5};
border_LHem = variants_info.left_hem.indiv_vars(:,variants_info.left_hem.indiv_vars{:,5}↙
==1);
border_LHem = variants_info.left_hem.indiv_vars(:,bord_ectop==1);
border_LHem = variants_info.left_hem.indiv_vars(variants_info.left_hem.indiv_vars{:,5}↙
==1,:);
ectopic_LHem = variants_info.left_hem.indiv_vars(variants_info.left_hem.indiv_vars{:,5}↙
==2,:);
ectopic_RHem = variants_info.right_hem.indiv_vars(variants_info.right_hem.indiv_vars{:,5}↙
==2,:);
border_RHem = variants_info.right_hem.indiv_vars(variants_info.right_hem.indiv_vars{:,5}↙
==1,:);
size_bord_LH = border_LHem(:,3);
size_bord_RH = border_RHem(:,3);
size_ectop_RH = ectopic_RHem(:,3);
size_ectop_LH = ectopic_LHem(:,3);
mean(size_bord_LH)
varSize_mm2 = border_LHem{:,3};
mean(border_LHem)
mean(varSize_mm2)
varSize_mm2 = border_RHem{:,3};
mean(varSize_mm2)
varSize_mm2 = ectopic_LHem{:,3};
mean(varSize_mm2)
varSize_mm2 = ectopic_RHem{:,3};
mean(varSize_mm2)
permute_variantproperties
load↙
('/Users/dianaperez/Desktop/Thesis/Spatial_Location/operc_nets_lefthemcluster_lefthem.↙
mat')
clear all
load↙
('/Users/dianaperez/Desktop/Thesis/Spatial_Location/operc_nets_lefthemcluster_lefthem.↙
mat')
load↙
('/Users/dianaperez/Desktop/Thesis/Spatial_Location/operc_nets_lefthemcluster_righthem.↙
mat')
LH_cluster_RH = LH_cluster;
load↙
('/Users/dianaperez/Desktop/Thesis/Spatial_Location/operc_nets_lefthemcluster_lefthem.↙
mat')
LH_cluster_LH = LH_cluster;
load↙
('/Users/dianaperez/Desktop/Thesis/Spatial_Location/operc_nets_righthemcluster_lefthem.↙
mat')
RH_cluster_LH = RH_cluster;
load↙
('/Users/dianaperez/Desktop/Thesis/Spatial_Location/operc_nets_righthemcluster_righthem.↙
mat')
RH_cluster_RH = RH_cluster;
clear LH_cluster RH_cluster
length(find(LH_cluster_LH.number==7))
length(find(LH_cluster_RH.number==7))
length(find(RH_cluster_RH.number==7))
```

```
length(find(RH_cluster_LH.number==7))
length(find(LH_cluster_LH.number==7))/length(LH_cluster_LH.number)
length(find(LH_cluster_RH.number==7))/length(LH_cluster_RH.number)
length(find(RH_cluster_RH.number==7))/length(RH_cluster_RH.number)
length(find(RH_cluster_LH.number==7))/length(RH_cluster_LH.number)
rgb_colors = [1 0 0;
1 1 0;
0 .8 0;
0 .6 .6;
0 0 0;
.3 0 .6;
1 .5 0;
.8 .8 .6;];
output_dir = '/Users/dianaperez/Desktop/Thesis/Spatial_Location/';
load([output_dir 'operc_nets_righthemcluster_righthem.mat']);
rightclust_righthem = RH_cluster;
load([output_dir 'operc_nets_righthemcluster_lefthem.mat']);
rightclust_lefthem = RH_cluster;
clear RH_cluster
network_names = {'DMN'  'FP' 'DAN' 'Lang'   'Sal'   'CO'    'SMl' 'PON'};
for net = 1:16
nets_left(net) = length(find(rightclust_lefthem.number(:,3)==net));
end
nets_left(6) = [];
nets_left(4) = [];
nets_left(10:13) = [];
nets_left(8) = [];
nets_left(2) = [];
sum(nets_left)
nets_left(4)/sum(nets_left)
for net = 1:16
nets_right(net) = length(find(rightclust_righthem.number(:,3)==net));
end
nets_right(6) = [];
nets_right(4) = [];
nets_right(10:13) = [];
nets_right(8) = [];
nets_right(2) = [];
nets_right(4)/sum(nets_right)
for net = 1:16
nets_left(net) = length(find(rightclust_lefthem.number(:,3)==net));
end
nets_left(7)/sum(nets_left)
length(find(RH_cluster_LH.number==7))
for net = 1:16
nets_right(net) = length(find(rightclust_righthem.number(:,3)==net));
end
nets_right(7)/sum(nets_right)
for net = 1:16
nets_left(net) = length(find(LH_cluster_LH.number(:,3)==net));
end
nets_left(7)/sum(nets_left)
for net = 1:16
nets_right(net) = length(find(LH_cluster_RH.number(:,3)==net));
end
nets_right(7)/sum(nets_right)
permute_variantproperties
[p_fdr, p_masked] = FDR([0.083, .906, .003, .996, .776, .224, .833,.167, .001, .999, .↙
161, .807,.769,.175,.675, .088,.051,.243,.702,.406,.518,.072,.899,.005,.995,.746,.2,.↙
148,.837,.667,.303,.224,.739,.315,.634,.106,.875],.05)
```

```
p_vals = [0.083, .906, .003, .996, .776, .224, .833,.167, .001, .999, .161, .807,.769,.↙
175,.675, .088,.051,.243,.702,.406,.518,.072,.899,.005,.995,.746,.2,.148,.837,.667,.303,.↙
224,.739,.315,.634,.106,.875];
permute_variantproperties
p_vals = [];
p_vals = [p_vals; 1 1];
clear p_vals
permute_variantproperties
for length(p_vals)
for y = 1:length(p_vals)
if p_vals(y,1)==0 && p_vals(y,2)==0
continue;
elseif p_vals(y,1) < p_vals(y,2) || p_vals(y,1) == p_vals(y,2)
p_vals(y,3) == p_vals(y,1);
elseif p_vals(y,1) > p_vals(y,2)
p_vals(y,3) == p_vals(y,2);
end
[p_fdr p_masked] = FDR(p_vals(:,3), .05);
end
y = 1;
p_vals(y,1)==0 && p_vals(y,2)==0
p_vals(y,1) < p_vals(y,2) || p_vals(y,1) == p_vals(y,2)
p_vals(y,1) > p_vals(y,2)
for y = 1:length(p_vals)
if p_vals(y,1)==0 && p_vals(y,2)==0
continue;
elseif p_vals(y,1) < p_vals(y,2) || p_vals(y,1) == p_vals(y,2)
p_vals(y,3) = p_vals(y,1);
elseif p_vals(y,1) > p_vals(y,2)
p_vals(y,3) = p_vals(y,2);
end
[p_fdr p_masked] = FDR(p_vals(:,3), .05);
end
final_pvals = p_vals(find(p_vals(:,3)>0),3);
[p_fdr p_masked] = FDR(final_pvals, .05);
permute_variantproperties
[p_fdr p_masked] = FDR(final_pvals, .05);
permute_variantproperties
p_vals = [p_vals(:,1); p_vals(:,2)];
p_fdr = FDR(p_vals,0.05)
permute_variantproperties
load↙
('/Users/dianaperez/Desktop/Thesis/Spatial_Location/HCP/Handedness/LeftvsRightHanders_tru↙
e_spCorr_1000_permutations.mat')
load↙
('/Users/dianaperez/Desktop/Thesis/Spatial_Location/HCP/Handedness/PseudoRightvsPseudoLef↙
tHanders_spCorr_1000_permutations.mat')
clear all
load↙
('/Users/dianaperez/Desktop/Thesis/Spatial_Location/HCP/Handedness/LeftvsRightHanders_tru↙
e_spCorr_1000_permutations.mat')
load↙
('/Users/dianaperez/Desktop/Thesis/Spatial_Location/HCP/Handedness/PseudoRightvsPseudoLef↙
tHanders_spCorr_1000_permutations.mat')
length(find(spCorrs<true_spCorr))/length(spCorrs)
length(find(spCorrs>true_spCorr))/length(spCorrs)
%-- 10/8/21, 1:00 PM --%
load('/Users/dianaperez/Desktop/Thesis/Variant_Properties/HCP384_new_split_networksxHem.↙
mat')
rgb_colors = [1 0 0;    %DMN
```

```
0 0 .6; %Vis
1 1 0; %FP
0 .8 0; %DAN
0 .6 .6;%VAN
0 0 0;%SAl
.3 0 .6;%CON
.2 1 1;%SMd
1 .5 0;%SMl
.6 .2 1;%Aud
.2 1 .2;%Tpole
0 .2 .4;%MTL
0 0 1; %PMN
.8 .8 .6]; %PON
leftHem = [networksxHem.clustersLH(:,1:3) networksxHem.clustersLH(:,5) networksxHem.↙
clustersLH(:,7:end)];
mean(leftHem)
rightHem = [networksxHem.clustersRH(:,1:3) networksxHem.clustersRH(:,5) networksxHem.↙
clustersRH(:,7:end)];
mean_RH = mean(rightHem);
data = [leftHem' rightHem'];
data = [mean_LH' mean_RH'];
mean_LH = mean(leftHem);
data = [mean_LH' mean_RH'];
data(11,:) = [];
bar(data)
close gcf
bar(data, .7)
bar(data, 1)
bar(data, 1.5)
bar(data, 1)
bar(data,1)
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.3, 0.9]);
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.9, 0.7]);
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.7, 0.7]);
xlabel('Assigned Network')
ylabel('Number of Variants')
ax = gca;
ax.FontSize = 24;
xticklabels({'DMN'  'Vis'   'FP'    'DAN'   'VAN'   'Sal'   'CO'    'SMd'   'SMl'   'Aud'↙
'MTL'   'PMN'   'PON'});
findobj(gca)
m = findobj(gca, 'Type', 'Bar')
hleg1 = legend(m(1:2), 'Right Hemisphere', 'Left Hemisphere', 'Location',↙
'SouthOutside');
print(gcf, '/Users/dianaperez/Desktop/Thesis/Figures/Figure5_barGraph_networks_HCP.jpg',↙
'-dpng', '-r300')
load↙
('/Users/dianaperez/Desktop/Thesis/Variant_Properties/Network_Comparisons/network_perms_n↙
umVars.mat')
good_nets = [net_perms(:,1:3) net_perms(:,5) net_perms(:,7:end)];
network_names = {'DMN'  'Vis'   'FP' 'DAN' 'Lang'   'Sal'   'CO'    'SMd'   'SMl'   'Aud'↙
'Tpole' 'MTL'   'PMN'   'PON'};
rgb_for_plot = {};
for n = 1:numel(network_names)
rgb_for_plot{n} = rgb_colors(n,:);
end
net_inds = [ind ind ind ind ind ind ind ind ind ind ind ind ind ind];
handles = plotSpread(good_nets, 'categoryMarkers', {'x', '.'}, 'categoryLabels',↙
{'Permuted Differences','True Difference'}, 'distributionColors', rgb_for_plot',↙
'categoryIdx', net_inds, 'xNames', network_names)
```

```
% for n = 1:numel(network_names)
%     scatter(n,good_nets(1,n), 'MarkerEdgeColor', rgb_for_plot{1,n}, 'MarkerFaceColor',↙
rgb_for_plot{1,n}, 'SizeData', 50)
% end
scatter([1:14],good_nets(1,:), 'MarkerEdgeColor', 'k', 'MarkerFaceColor', 'k',↙
'SizeData', 50)
scatter(6,good_nets(1,6), 'MarkerEdgeColor', 'w', 'MarkerFaceColor', 'w', 'SizeData', 50)
ylabel('Difference in Number of Variants')
xlabel('Assigned Network')
axis([0, 15, -0.4, .7])
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.7, 0.7]);
print(gcf, '/Users/dianaperez/Desktop/Thesis/Figures/Figure5_spreadPlot_networks_HCP.↙
jpg', '-dpng', '-r300')
load↙
('/Users/dianaperez/Desktop/Thesis/Variant_Properties/Network_Comparisons/network_perms_n↙
umVars.mat')
good_nets = [net_perms(:,1:3) net_perms(:,5) net_perms(:,7:end)];
network_names = {'DMN'  'Vis'   'FP' 'DAN' 'Lang'   'Sal'   'CO'    'SMd'   'SMl'   'Aud'↙
'Tpole' 'MTL'   'PMN'   'PON'};
rgb_for_plot = {};
for n = 1:numel(network_names)
rgb_for_plot{n} = rgb_colors(n,:);
end
ind = zeros(1001,1);
ind(1,1) = 1;
net_inds = [ind ind ind ind ind ind ind ind ind ind ind ind ind ind];
handles = plotSpread(good_nets, 'categoryMarkers', {'x', '.'}, 'categoryLabels',↙
{'Permuted Differences','True Difference'}, 'distributionColors', rgb_for_plot',↙
'categoryIdx', net_inds, 'xNames', network_names)
% for n = 1:numel(network_names)
%     scatter(n,good_nets(1,n), 'MarkerEdgeColor', rgb_for_plot{1,n}, 'MarkerFaceColor',↙
rgb_for_plot{1,n}, 'SizeData', 50)
% end
scatter([1:14],good_nets(1,:), 'MarkerEdgeColor', 'k', 'MarkerFaceColor', 'k',↙
'SizeData', 50)
scatter(6,good_nets(1,6), 'MarkerEdgeColor', 'w', 'MarkerFaceColor', 'w', 'SizeData', 50)
ylabel('Difference in Number of Variants')
xlabel('Assigned Network')
axis([0, 15, -0.4, .7])
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.7, 0.7]);
addpath '/Users/dianaperez/Documents/MATLAB/plotSpread/plotSpread'
load↙
('/Users/dianaperez/Desktop/Thesis/Variant_Properties/Network_Comparisons/network_perms_n↙
umVars.mat')
good_nets = [net_perms(:,1:3) net_perms(:,5) net_perms(:,7:end)];
network_names = {'DMN'  'Vis'   'FP' 'DAN' 'Lang'   'Sal'   'CO'    'SMd'   'SMl'   'Aud'↙
'Tpole' 'MTL'   'PMN'   'PON'};
rgb_for_plot = {};
for n = 1:numel(network_names)
rgb_for_plot{n} = rgb_colors(n,:);
end
ind = zeros(1001,1);
ind(1,1) = 1;
net_inds = [ind ind ind ind ind ind ind ind ind ind ind ind ind ind];
handles = plotSpread(good_nets, 'categoryMarkers', {'x', '.'}, 'categoryLabels',↙
{'Permuted Differences','True Difference'}, 'distributionColors', rgb_for_plot',↙
'categoryIdx', net_inds, 'xNames', network_names)
% for n = 1:numel(network_names)
%     scatter(n,good_nets(1,n), 'MarkerEdgeColor', rgb_for_plot{1,n}, 'MarkerFaceColor',↙
rgb_for_plot{1,n}, 'SizeData', 50)
```

```
% end
scatter([1:14],good_nets(1,:), 'MarkerEdgeColor', 'k', 'MarkerFaceColor', 'k',↙
'SizeData', 50)
scatter(6,good_nets(1,6), 'MarkerEdgeColor', 'w', 'MarkerFaceColor', 'w', 'SizeData', 50)
ylabel('Difference in Number of Variants')
xlabel('Assigned Network')
axis([0, 15, -0.4, .7])
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.7, 0.7]);
clear gca
load↙
('/Users/dianaperez/Desktop/Thesis/Variant_Properties/Network_Comparisons/network_perms_n↙
umVars.mat')
good_nets = [net_perms(:,1:3) net_perms(:,5) net_perms(:,7:end)];
network_names = {'DMN'  'Vis'   'FP' 'DAN' 'Lang'   'Sal'   'CO'    'SMd'   'SMl'   'Aud'↙
'Tpole' 'MTL'   'PMN'   'PON'};
rgb_for_plot = {};
for n = 1:numel(network_names)
rgb_for_plot{n} = rgb_colors(n,:);
end
ind = zeros(1001,1);
ind(1,1) = 1;
net_inds = [ind ind ind ind ind ind ind ind ind ind ind ind ind ind];
handles = plotSpread(good_nets, 'categoryMarkers', {'x', '.'}, 'categoryLabels',↙
{'Permuted Differences','True Difference'}, 'distributionColors', rgb_for_plot',↙
'categoryIdx', net_inds, 'xNames', network_names)
% for n = 1:numel(network_names)
%     scatter(n,good_nets(1,n), 'MarkerEdgeColor', rgb_for_plot{1,n}, 'MarkerFaceColor',↙
rgb_for_plot{1,n}, 'SizeData', 50)
% end
scatter([1:14],good_nets(1,:), 'MarkerEdgeColor', 'k', 'MarkerFaceColor', 'k',↙
'SizeData', 50)
scatter(6,good_nets(1,6), 'MarkerEdgeColor', 'w', 'MarkerFaceColor', 'w', 'SizeData', 50)
ylabel('Difference in Number of Variants')
xlabel('Assigned Network')
axis([0, 15, -0.4, .7])
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.7, 0.7]);
ax = gca;
ax.FontSize = 24;
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.9, 0.7]);
print(gcf, '/Users/dianaperez/Desktop/Thesis/Figures/Figure3_spreadPlot_networks_HCP.↙
jpg', '-dpng', '-r300')
load('/Users/dianaperez/Desktop/Thesis/Variant_Properties/HCP384_new_split_networksxHem.↙
mat')
leftHem = [networksxHem.clustersLH(:,1:3) networksxHem.clustersLH(:,5) networksxHem.↙
clustersLH(:,7:end)];
mean_LH = mean(leftHem);
rightHem = [networksxHem.clustersRH(:,1:3) networksxHem.clustersRH(:,5) networksxHem.↙
clustersRH(:,7:end)];
mean_RH = mean(rightHem);
data = [mean_LH' mean_RH'];
data(11,:) = []; %delete Tpole data bc zero
%[h,mu,sigma,q,notch] = al_goodplot(leftHem,1:14,.2,[ 0    0.4470    0.7410],'left');
%[h,mu,sigma,q,notch] = al_goodplot(rightHem,1:14,.2,[0.4660    0.6740↙
0.1880],'right');
bar(data,1)
axis([0, 15, -0.1, 10])
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.9, 0.7]);
xlabel('Assigned Network')
ylabel('Number of Variants')
ax = gca;
```

```
ax.FontSize = 24;
xticklabels({'DMN'  'Vis'   'FP'    'DAN'   'Lang'  'Sal'   'CO'    'SMd'   'SMl'   'Aud'↙
'MTL'   'PMN'   'PON'});
m = findobj(gca, 'Type', 'Bar')
hleg1 = legend(m(1:2), 'Right Hemisphere', 'Left Hemisphere', 'Location',↙
'SouthOutside');
print(gcf, '/Users/dianaperez/Desktop/Thesis/Figures/Figure5_barGraph_networks_HCP.jpg',↙
'-dpng', '-r300')
load('/Users/dianaperez/Desktop/Thesis/Variant_Properties/HCP384_new_split_networksxHem.↙
mat')
leftHem = [networksxHem.clustersLH(:,1:3) networksxHem.clustersLH(:,5) networksxHem.↙
clustersLH(:,7:end)];
mean_LH = mean(leftHem);
rightHem = [networksxHem.clustersRH(:,1:3) networksxHem.clustersRH(:,5) networksxHem.↙
clustersRH(:,7:end)];
mean_RH = mean(rightHem);
data = [mean_LH' mean_RH'];
data(11,:) = []; %delete Tpole data bc zero
%[h,mu,sigma,q,notch] = al_goodplot(leftHem,1:14,.2,[ 0    0.4470    0.7410],'left');
%[h,mu,sigma,q,notch] = al_goodplot(rightHem,1:14,.2,[0.4660    0.6740↙
0.1880],'right');
bar(data,1)
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.9, 0.7]);
xlabel('Assigned Network')
ylabel('Number of Variants')
ax = gca;
ax.FontSize = 24;
xticklabels({'DMN'  'Vis'   'FP'    'DAN'   'Lang'  'Sal'   'CO'    'SMd'   'SMl'   'Aud'↙
'MTL'   'PMN'   'PON'});
m = findobj(gca, 'Type', 'Bar')
hleg1 = legend(m(1:2), 'Right Hemisphere', 'Left Hemisphere', 'Location',↙
'SouthOutside');
print(gcf, '/Users/dianaperez/Desktop/Thesis/Figures/Figure3_barGraph_networks_HCP.jpg',↙
'-dpng', '-r300')
clear all
RH_clust = ft_read_cifti_mod('/Users/dianaperez/Desktop/Thesis/operc_mask_moreRHvars.↙
dtseries.nii');
LH_clust = ft_read_cifti_mod('/Users/dianaperez/Desktop/Thesis/operc_mask_moreLHvars.↙
dtseries.nii');
LH_clust_gifti = insert_nonbrain(LH_clust.data, 'both', LH_clust);
left_hem = LH_clust_gifti(1:(64984/2));
right_hem = LH_clust_gifti(32493:end);
new_cifti = [right_hem;left_hem];
new_cifti = new_cifti(LH_clust.brainstructure>0);
LH_clust.data = new_cifti;
ft_write_cifti_mod('/Users/dianaperez/Desktop/Thesis/operc_mask_moreLHvars_onRH.dtseries.↙
nii', LH_clust)
RH_clust_gifti = insert_nonbrain(RH_clust.data, 'both', RH_clust);
left_hem = RH_clust_gifti(1:(64984/2));
right_hem = RH_clust_gifti(32493:end);
new_cifti = [right_hem;left_hem];
new_cifti = new_cifti(RH_clust.brainstructure>0);
RH_clust.data = new_cifti;
ft_write_cifti_mod('/Users/dianaperez/Desktop/Thesis/operc_mask_moreRHvars_onLH.dtseries.↙
nii', RH_clust)
clear all
load('/Users/dianaperez/Desktop/Thesis/Variant_Properties/HCP384_new_split_networksxHem.↙
mat')
output_dir = '/Users/dianaperez/Desktop/Thesis/Spatial_Location/';
load([output_dir 'operc_nets_lefthemcluster_righthem.mat']);
```

```
leftclust_righthem = LH_cluster;
load([output_dir 'operc_nets_lefthemcluster_lefthem.mat']);
leftclust_lefthem = LH_cluster;
clear LH_cluster
network_names = {'DMN'  'FP' 'DAN' 'Lang'   'Sal'   'CO'    'SMl'};
for net = 1:16
nets_left(net) = length(find(leftclust_lefthem.number(:,3)==net));
end
nets_left(6) = [];
nets_left(4) = [];
nets_left(10:end) = [];
nets_left(8) = [];
nets_left(2) = [];
operc_cluster
addpath '/Users/dianaperez/Documents/GitHub/Lateralization_Variants/thesis_scripts'
RH_mask_gifti = insert_nonbrain(operc_mask_RH, 'both', diffmap);
LH_mask_gifti = insert_nonbrain(operc_mask_LH, 'both', diffmap);
RH_mask_flipped = [RH_mask_gifti(32493:end); RH_mask_gifti(1:32492)];
LH_mask_flipped = [LH_mask_gifti(32493:end); LH_mask_gifti(1:32492)];
RH_mask_flipped = RH_mask_flipped(diffmap.brainstructure>0);
LH_mask_flipped = LH_mask_flipped(diffmap.brainstructure>0);
RH_vertices = find(RH_mask_flipped == 1);
RH_cluster_vars = [];
for sub = 1:length(subs)
sub_data = [];
var_map = ft_read_cifti_mod([data_dir num2str(subs(sub)) '_uniqueIDs_afterReassign.↙
dtseries.nii']);
net_assign = ft_read_cifti_mod([data_dir num2str(subs(sub)) '_reassigned.dtseries.nii']);
unique_IDs = unique(var_map.data(RH_vertices));
if unique_IDs(1) == 0
unique_IDs(1) = [];
end
sub_data(:,1) = unique_IDs;
for var = 1:length(unique_IDs)
verts = find(var_map.data==sub_data(var,1));
sub_data(var,2) = verts(1);
sub_data(var,3) = net_assign.data(verts(1));
end
RH_cluster_vars = [RH_cluster_vars; sub_data];
for net = 1:16
if isempty(sub_data)
RH_cluster_proportion(sub,net) = 0;
RH_cluster_number(sub,net) = 0;
else
RH_cluster_proportion(sub,net) = length(find(sub_data(:,3)==net))/size(sub_data,1);
RH_cluster_number(sub,net) = length(find(sub_data(:,3)==net));
end
end
end
RH_cluster = [];
RH_cluster.vars = RH_cluster_vars;
RH_cluster.number = RH_cluster_number;
RH_cluster.proportion = RH_cluster_proportion;
save([output_dir 'operc_nets_righthemcluster_righthem.mat'], 'RH_cluster')
LH_vertices = find(LH_mask_flipped == 1);
LH_cluster_vars = [];
for sub = 1:length(subs)
sub_data = [];
var_map = ft_read_cifti_mod([data_dir num2str(subs(sub)) '_uniqueIDs_afterReassign.↙
dtseries.nii']);
```

```
net_assign = ft_read_cifti_mod([data_dir num2str(subs(sub)) '_reassigned.dtseries.nii']);
unique_IDs = unique(var_map.data(LH_vertices));
if unique_IDs(1) == 0
unique_IDs(1) = [];
end
sub_data(:,1) = unique_IDs;
for var = 1:length(unique_IDs)
verts = find(var_map.data==sub_data(var,1));
sub_data(var,2) = verts(1);
sub_data(var,3) = net_assign.data(verts(1));
end
LH_cluster_vars = [LH_cluster_vars; sub_data];
for net = 1:16
if isempty(sub_data)
LH_cluster_proportion(sub,net) = 0;
LH_cluster_number(sub,net) = 0;
else
LH_cluster_proportion(sub,net) = length(find(sub_data(:,3)==net))/size(sub_data,1);
LH_cluster_number(sub,net) = length(find(sub_data(:,3)==net));
end
end
end
LH_cluster = [];
LH_cluster.vars = LH_cluster_vars;
LH_cluster.number = LH_cluster_number;
LH_cluster.proportion = LH_cluster_proportion;
save([output_dir 'operc_nets_lefthemcluster_righthem.mat'], 'LH_cluster')
clear all
load↙
('/Users/dianaperez/Desktop/Thesis/Spatial_Location/operc_nets_lefthemcluster_lefthem.↙
mat')
load↙
('/Users/dianaperez/Desktop/Thesis/Spatial_Location/operc_nets_righthemcluster_lefthem.↙
mat')
LH_cluster_LHem
LH_cluster_LHem = LH_cluster;
RH_cluster_LHem = RH_cluster;
load↙
('/Users/dianaperez/Desktop/Thesis/Spatial_Location/operc_nets_lefthemcluster_righthem.↙
mat')
load↙
('/Users/dianaperez/Desktop/Thesis/Spatial_Location/operc_nets_righthemcluster_righthem.↙
mat')
LH_cluster_RHem = LH_cluster;
RH_cluster_RHem = RH_cluster;
clear LH_cluster RH_cluster
LH_cluster = LH_cluster_LHem.number;
input_for_anova = [];
for net = 1:16
numvars = LH_cluster(:,net);
numvars = numvars(numvars>0);
hemi = ones(length(numvars),1);
network = zeros(length(numvars),1);
network(:,:) = net;
input_for_anova = [hemi network numvars];
end
net = 1
numvars = LH_cluster(:,net);
numvars = numvars(numvars>0);
hemi = ones(length(numvars),1);
```

```
network = zeros(length(numvars),1);
unique(network)
network(:,:) = net;
unique(network)
input_for_anova = [input_for_anova; hemi network numvars];
input_for_anova = [];
for net = 1:16
numvars = LH_cluster(:,net);
numvars = numvars(numvars>0);
hemi = ones(length(numvars),1);
network = zeros(length(numvars),1);
network(:,:) = net;
input_for_anova = [input_for_anova; hemi network numvars];
end
RH_cluster = LH_cluster_RHem.number;
for net = 1:16
numvars = RH_cluster(:,net);
numvars = numvars(numvars>0);
hemi = ones(length(numvars),1);
hemi(:,:) = 2;
network = zeros(length(numvars),1);
network(:,:) = net;
input_for_anova = [input_for_anova; hemi network numvars];
end
input_for_anova = [];
LH_cluster = RH_cluster_LHem.number;
for net = 1:16
numvars = LH_cluster(:,net);
numvars = numvars(numvars>0);
hemi = ones(length(numvars),1);
network = zeros(length(numvars),1);
network(:,:) = net;
input_for_anova = [input_for_anova; hemi network numvars];
end
RH_cluster = RH_cluster_RHem.number;
for net = 1:16
numvars = RH_cluster(:,net);
numvars = numvars(numvars>0);
hemi = ones(length(numvars),1);
hemi(:,:) = 2;
network = zeros(length(numvars),1);
network(:,:) = net;
input_for_anova = [input_for_anova; hemi network numvars];
end
input_for_anova = [];
LH_cluster = RH_cluster_LHem.number;
for net = 1:16
numvars = LH_cluster(:,net);
%numvars = numvars(numvars>0);
hemi = ones(length(numvars),1);
network = zeros(length(numvars),1);
network(:,:) = net;
input_for_anova = [input_for_anova; hemi network numvars];
end
RH_cluster = RH_cluster_RHem.number;
for net = 1:16
numvars = RH_cluster(:,net);
%numvars = numvars(numvars>0);
hemi = ones(length(numvars),1);
hemi(:,:) = 2;
```

```
network = zeros(length(numvars),1);
network(:,:) = net;
input_for_anova = [input_for_anova; hemi network numvars];
end
input_for_anova = [];
LH_cluster = RH_cluster_LHem.number;
for net = 1:16
numvars = LH_cluster(:,net);
%numvars = numvars(numvars>0);
if unique(numvars)==0
continue
end
hemi = ones(length(numvars),1);
network = zeros(length(numvars),1);
network(:,:) = net;
input_for_anova = [input_for_anova; hemi network numvars];
end
RH_cluster = RH_cluster_RHem.number;
for net = 1:16
numvars = RH_cluster(:,net);
%numvars = numvars(numvars>0);
if unique(numvars)==0
continue
end
hemi = ones(length(numvars),1);
hemi(:,:) = 2;
network = zeros(length(numvars),1);
network(:,:) = net;
input_for_anova = [input_for_anova; hemi network numvars];
end
input_for_anova = [];
LH_cluster = RH_cluster_LHem.number;
for net = 1:16
numvars = LH_cluster(:,net);
%numvars = numvars(numvars>0);
%     if unique(numvars)==0
%         continue
%     end
%     hemi = ones(length(numvars),1);
hemi = 1;
%    network = zeros(length(numvars),1);
%    network(:,:) = net;
input_for_anova = [input_for_anova; hemi net length(numvars)];
end
input_for_anova = [];
LH_cluster = RH_cluster_LHem.number;
for net = 1:16
numvars = LH_cluster(:,net);
%numvars = numvars(numvars>0);
%     if unique(numvars)==0
%         continue
%     end
%     hemi = ones(length(numvars),1);
hemi = 1;
%    network = zeros(length(numvars),1);
%    network(:,:) = net;
input_for_anova = [input_for_anova; hemi net sum(numvars)];
end
H_cluster = RH_cluster_RHem.number;
for net = 1:16
```

```
numvars = RH_cluster(:,net);
%numvars = numvars(numvars>0);
if unique(numvars)==0
continue
end
%hemi = ones(length(numvars),1);
hemi = 2;
%network = zeros(length(numvars),1);
%network(:,:) = net;
input_for_anova = [input_for_anova; hemi net sum(numvars)];
end
input_for_anova = [];
LH_cluster = RH_cluster_LHem.number;
for net = 1:16
numvars = LH_cluster(:,net);
%numvars = numvars(numvars>0);
%     if unique(numvars)==0
%         continue
%     end
%     hemi = ones(length(numvars),1);
hemi = 1;
%    network = zeros(length(numvars),1);
%    network(:,:) = net;
input_for_anova = [input_for_anova; hemi net sum(numvars)];
end
RH_cluster = RH_cluster_RHem.number;
for net = 1:16
numvars = RH_cluster(:,net);
%numvars = numvars(numvars>0);
%     if unique(numvars)==0
%         continue
%     end
%hemi = ones(length(numvars),1);
hemi = 2;
%network = zeros(length(numvars),1);
%network(:,:) = net;
input_for_anova = [input_for_anova; hemi net sum(numvars)];
end
input_for_anova = [];
LH_cluster = LH_cluster_LHem.number;
for net = 1:16
numvars = LH_cluster(:,net);
%numvars = numvars(numvars>0);
%     if unique(numvars)==0
%         continue
%     end
%     hemi = ones(length(numvars),1);
hemi = 1;
%    network = zeros(length(numvars),1);
%    network(:,:) = net;
input_for_anova = [input_for_anova; hemi net sum(numvars)];
end
RH_cluster = LH_cluster_RHem.number;
for net = 1:16
numvars = RH_cluster(:,net);
%numvars = numvars(numvars>0);
%     if unique(numvars)==0
%         continue
%     end
%hemi = ones(length(numvars),1);
```

```
hemi = 2;
%network = zeros(length(numvars),1);
%network(:,:) = net;
input_for_anova = [input_for_anova; hemi net sum(numvars)];
end
sum(LH_cluster_LHem.number, 1)
sum(LH_cluster_LHem.number, 2);
mean(ans)
sum(LH_cluster_LHem.number, 2);
sum(LH_cluster_RHem.number, 2);
mean(ans)
sum(RH_cluster_LHem.number, 2);
mean(ans)
sum(RH_cluster_RHem.number, 2);
mean(ans)
input_for_anova = [];
LH_cluster = LH_cluster_LHem.number;
count = 1;
for net = 1:16
numvars = LH_cluster(:,net);
%numvars = numvars(numvars>0);
if unique(numvars)==0
continue
end
hemi = ones(length(numvars),1);
%hemi = 1;
network = zeros(length(numvars),1);
network(:,:) = net;
input_for_anova = [input_for_anova; count hemi network sum(numvars)];
count = count + 1;
end
input_for_anova = [];
LH_cluster = LH_cluster_LHem.number;
count = 1;
for net = 1:16
numvars = LH_cluster(:,net);
%numvars = numvars(numvars>0);
if unique(numvars)==0
continue
end
hemi = ones(length(numvars),1);
%hemi = 1;
network = zeros(length(numvars),1);
network(:,:) = net;
sub = zeros(length(numvars),1);
sub(:,:) = count;
input_for_anova = [input_for_anova; sub hemi network sum(numvars)];
count = count + 1;
end
LH_cluster = LH_cluster_LHem.number;
count = 1;
net = 1;
numvars = LH_cluster(:,net);
if unique(numvars)==0
continue
end
hemi = ones(length(numvars),1);
hemi(:,:) = 1;
sub = [1:384];
network = zeros(length(numvars),1);
```

```
network(:,:) = net;
sub = [1:384]';
input_for_anova = [input_for_anova; sub hemi network numvars];
input_for_anova = [];
LH_cluster = LH_cluster_LHem.number;
for net = 1:16
numvars = LH_cluster(:,net);
%numvars = numvars(numvars>0);
if unique(numvars)==0
continue
end
hemi = ones(length(numvars),1);
hemi(:,:) = 1;
network = zeros(length(numvars),1);
network(:,:) = net;
sub = [1:384]';
input_for_anova = [input_for_anova; sub hemi network numvars];
end
RH_cluster = LH_cluster_RHem.number;
for net = 1:16
numvars = RH_cluster(:,net);
%numvars = numvars(numvars>0);
if unique(numvars)==0
continue
end
sub = [1:384]';
hemi = ones(length(numvars),1);
hemi = 2;
network = zeros(length(numvars),1);
network(:,:) = net;
input_for_anova = [input_for_anova; sub hemi net numvars];
end
RH_cluster = LH_cluster_RHem.number;
for net = 1:16
numvars = RH_cluster(:,net);
%numvars = numvars(numvars>0);
if unique(numvars)==0
continue
end
sub = [1:384]';
hemi = ones(length(numvars),1);
hemi(:,:) = 2;
network = zeros(length(numvars),1);
network(:,:) = net;
input_for_anova = [input_for_anova; sub hemi net numvars];
end
RH_cluster = LH_cluster_RHem.number;
for net = 1:16
numvars = RH_cluster(:,net);
%numvars = numvars(numvars>0);
if unique(numvars)==0
continue
end
sub = [1:384]';
hemi = ones(length(numvars),1);
hemi(:,:) = 2;
network = zeros(length(numvars),1);
network(:,:) = net;
input_for_anova = [input_for_anova; sub hemi network numvars];
end
```

```
input_for_anova = [];
LH_cluster = RH_cluster_LHem.number;
for net = 1:16
numvars = LH_cluster(:,net);
%numvars = numvars(numvars>0);
if unique(numvars)==0
continue
end
hemi = ones(length(numvars),1);
hemi(:,:) = 1;
network = zeros(length(numvars),1);
network(:,:) = net;
sub = [1:384]';
input_for_anova = [input_for_anova; sub hemi network numvars];
end
RH_cluster = RH_cluster_RHem.number;
for net = 1:16
numvars = RH_cluster(:,net);
%numvars = numvars(numvars>0);
if unique(numvars)==0
continue
end
sub = [1:384]';
hemi = ones(length(numvars),1);
hemi(:,:) = 2;
network = zeros(length(numvars),1);
network(:,:) = net;
input_for_anova = [input_for_anova; sub hemi network numvars];
end
help anova1
load↙
('/Users/dianaperez/Desktop/Thesis/Variant_Properties/Permutation_Tests/HCP384_LhemvsRhem↙
_avgSurfArea.mat')
clear all
load↙
('/Users/dianaperez/Desktop/Thesis/Variant_Properties/Permutation_Tests/HCP384_LhemvsRhem↙
_avgSurfArea.mat')
length(find(output_mat(2:end,:)<output_mat(1,1)))
length(find(output_mat(2:end,:)>output_mat(1,1)))
load↙
('/Users/dianaperez/Desktop/Thesis/Variant_Properties/HCP384_new_split_variants_info_wSur↙
fArea.mat')
leftHem = variants_info.left_hem.group_avg{:,4};
rightHem = variants_info.right_hem.group_avg{:,4};
[h,mu,sigma,q,notch] = al_goodplot(leftHem,0.1,.2,[ 0    0.4470    0.7410],'left');
[h,mu,sigma,q,notch] = al_goodplot(rightHem,0.2,.2,[0.8500    0.3250    0.0980],'right');
xticks([0])
xticklabels('Average Variant Size')
axis([-0.2, 0.5, 50, 400])
ax = gca;
ax.FontSize = 24;
addpath '/Users/dianaperez/Documents/MATLAB/upload'
leftHem = variants_info.left_hem.group_avg{:,4};
rightHem = variants_info.right_hem.group_avg{:,4};
[h,mu,sigma,q,notch] = al_goodplot(leftHem,0.1,.2,[ 0    0.4470    0.7410],'left');
[h,mu,sigma,q,notch] = al_goodplot(rightHem,0.2,.2,[0.8500    0.3250    0.0980],'right');
xticks([0])
xticklabels('Average Variant Size')
axis([-0.2, 0.5, 50, 400])
ax = gca;
```

```
ax.FontSize = 24;
close gcf
load('/Users/dianaperez/Desktop/Thesis/Variant_Properties/HCP384_new_split_variants_info.↙
mat')
leftHem = variants_info.left_hem.group_avg{:,4};
rightHem = variants_info.right_hem.group_avg{:,4};
[h,mu,sigma,q,notch] = al_goodplot(leftHem,0.1,.2,[ 0    0.4470    0.7410],'left');
[h,mu,sigma,q,notch] = al_goodplot(rightHem,0.15,.2,[0.8500    0.3250↙
0.0980],'right');
xticks([0])
xticklabels('Average Variant Size')
axis([-0.2, 0.5, 50, 400])
ax = gca;
ax.FontSize = 24;
close gcf
load↙
('/Users/dianaperez/Desktop/Thesis/Variant_Properties/HCP384_new_split_variants_info_wSur↙
fArea.mat')
leftHem = variants_info.left_hem.group_avg{:,4};
rightHem = variants_info.right_hem.group_avg{:,4};
[h,mu,sigma,q,notch] = al_goodplot(leftHem,0.1,.2,[ 0    0.4470    0.7410],'left');
[h,mu,sigma,q,notch] = al_goodplot(rightHem,0.15,.2,[0.8500    0.3250↙
0.0980],'right');
xticks([0])
xticklabels('Average Variant Size')
axis([-0.2, 0.5, 50, 400])
ax = gca;
ax.FontSize = 24;
close gcf
leftHem = variants_info.left_hem.group_avg{:,4};
rightHem = variants_info.right_hem.group_avg{:,4};
[h,mu,sigma,q,notch] = al_goodplot(leftHem,0.1,.2,[ 0    0.4470    0.7410],'left');
[h,mu,sigma,q,notch] = al_goodplot(rightHem,0.11,.2,[0.8500    0.3250↙
0.0980],'right');
xticks([0])
xticklabels('Average Variant Size')
axis([-0.2, 0.5, 50, 400])
ax = gca;
ax.FontSize = 24;
close gcf
leftHem = variants_info.left_hem.group_avg{:,4};
rightHem = variants_info.right_hem.group_avg{:,4};
[h,mu,sigma,q,notch] = al_goodplot(leftHem,0.1,.2,[ 0    0.4470    0.7410],'left');
[h,mu,sigma,q,notch] = al_goodplot(rightHem,0.11,.2,[0.8500    0.3250↙
0.0980],'right');
xticks([0])
xticklabels('Average Variant Size')
axis([-0.2, 0.5, 100, 700])
ax = gca;
ax.FontSize = 24;
max(variants_info.left_hem.group_avg{:,4};)
max(variants_info.left_hem.group_avg{:,4})
max(variants_info.right_hem.group_avg{:,4})
close gcf
leftHem = variants_info.left_hem.group_avg{:,4};
rightHem = variants_info.right_hem.group_avg{:,4};
[h,mu,sigma,q,notch] = al_goodplot(leftHem,0.1,.2,[ 0    0.4470    0.7410],'left');
[h,mu,sigma,q,notch] = al_goodplot(rightHem,0.11,.2,[0.8500    0.3250↙
0.0980],'right');
xticks([0])
```

```
xticklabels('Average Variant Size')
axis([-0.2, 0.5, 100, 800])
ax = gca;
ax.FontSize = 24;
ylabel('Surface Area (mm^2)')
xticks([1.105])
xticklabels('Average Variant Size')
close gcf
leftHem = variants_info.left_hem.group_avg{:,4};
rightHem = variants_info.right_hem.group_avg{:,4};
[h,mu,sigma,q,notch] = al_goodplot(leftHem,0.1,.2,[ 0    0.4470    0.7410],'left');
[h,mu,sigma,q,notch] = al_goodplot(rightHem,0.11,.2,[0.8500    0.3250↙
0.0980],'right');
xticks([1.105])
xticklabels('Average Variant Size')
axis([-0.2, 0.5, 100, 800])
ax = gca;
ax.FontSize = 24;
ylabel('Surface Area (mm^2)')
xticks([0.105])
ax = gca;
ax.FontSize = 24;
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.3, 0.7]); %first and second↙
control position on screen, third controls width, and fourth controls height
print(gcf, '/Users/dianaperez/Desktop/Thesis/Figures/Figure2_violin_avgVarSize_HCP.jpg',↙
'-dpng', '-r300')
perms_varSize = output_mat;
ind = zeros(1001,1);
ind(1,1) = 1;
handles = plotSpread(all_perms, 'categoryMarkers', {'o', '.'}, 'categoryLabels',↙
{'Permuted Correlations','True Correlation'}, 'categoryColors', {'k','r'}, 'categoryIdx',↙
[ind], 'xNames', {'Average Variant Size'}, 'xValues', [1])
scatter(1,perms_varSize(1,:), 'MarkerEdgeColor', 'red', 'MarkerFaceColor', 'red',↙
'SizeData', 50)
ax = gca;
ax.FontSize = 24;
axis([0.5, 1.5, -25, 10])
handles = plotSpread(perms_varSize, 'categoryMarkers', {'o', '.'}, 'categoryLabels',↙
{'Permuted Correlations','True Correlation'}, 'categoryColors', {'k','r'}, 'categoryIdx',↙
[ind], 'xNames', {'Average Variant Size'}, 'xValues', [1])
scatter(1,perms_varSize(1,:), 'MarkerEdgeColor', 'red', 'MarkerFaceColor', 'red',↙
'SizeData', 50)
ax = gca;
ax.FontSize = 24;
axis([0.5, 1.5, -25, 10])
close gcf
handles = plotSpread(perms_varSize, 'categoryMarkers', {'o', '.'}, 'categoryLabels',↙
{'Permuted Correlations','True Correlation'}, 'categoryColors', {'k','r'}, 'categoryIdx',↙
[ind], 'xNames', {'Average Variant Size'}, 'xValues', [1])
scatter(1,perms_varSize(1,:), 'MarkerEdgeColor', 'red', 'MarkerFaceColor', 'red',↙
'SizeData', 50)
ax = gca;
ax.FontSize = 24;
ylabel('Difference in Surface Area (mm^2)')
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.3, 0.7]); %first and second↙
control position on screen, third controls width, and fourth controls height
print(gcf, '/Users/dianaperez/Desktop/Thesis/Figures/Figure2_spreadPlot_varSize_HCP.jpg',↙
'-dpng', '-r300')
axis([0.5, 1.5, -60, 20])
print(gcf, '/Users/dianaperez/Desktop/Thesis/Figures/Figure2_spreadPlot_varSize_HCP.jpg',↙
```

```
'-dpng', '-r300')
load↙
('/Users/dianaperez/Desktop/Thesis/Spatial_Location/operc_nets_lefthemcluster_lefthem.↙
mat')
clear all
load↙
('/Users/dianaperez/Desktop/Thesis/Spatial_Location/operc_nets_lefthemcluster_lefthem.↙
mat')
LH_cluster_onLH = LH_cluster;
load↙
('/Users/dianaperez/Desktop/Thesis/Spatial_Location/operc_nets_lefthemcluster_righthem.↙
mat')
LH_cluster_onRH = LH_cluster;
clear LH_cluster
load↙
('/Users/dianaperez/Desktop/Thesis/Spatial_Location/operc_nets_righthemcluster_lefthem.↙
mat')
RH_cluster_onLH = RH_cluster;
load↙
('/Users/dianaperez/Desktop/Thesis/Spatial_Location/operc_nets_righthemcluster_righthem.↙
mat')
RH_cluster_onRH = RH_cluster;
clear RH_cluster
sum(LH_cluster_onLH(:,1))
sum(LH_cluster_onLH.number(:,1))
sum(LH_cluster_onLH.number(:,3))
sum(LH_cluster_onLH.number(:,5))
sum(LH_cluster_onLH.number(:,7\))
sum(LH_cluster_onLH.number(:,7))
sum(LH_cluster_onLH.number(:,8))
sum(LH_cluster_onLH.number(:,9))
sum(LH_cluster_onLH.number(:,11))
sum(LH_cluster_onRH.number(:,1))
sum(LH_cluster_onRH.number(:,3))
sum(LH_cluster_onRH.number(:,5))
sum(LH_cluster_onRH.number(:,7))
sum(LH_cluster_onRH.number(:,8))
sum(LH_cluster_onRH.number(:,9))
sum(LH_cluster_onRH.number(:,11))
for net = 1:16
nets_left(net) = length(find(LH_cluster_onLH.number(:,3)==net));
end
nets_left(6) = [];
nets_left(4) = [];
nets_left(10:end) = [];
nets_left(8) = [];
nets_left(2) = [];
for net = 1:16
nets_left(net) = length(find(LH_cluster_onLH.vars(:,3)==net));
end
nets_left(6) = [];
nets_left(4) = [];
nets_left(10:end) = [];
nets_left(8) = [];
nets_left(2) = [];
sum(nets_left
sum(nets_left)
total_vars = 306;
for net = 1:length(nets_left)
perc = nets_left(net)/total_vars
```

```
end
for net = 1:16
nets_right(net) = length(find(LH_cluster_onRH.vars(:,3)==net));
end
nets_right(6) = [];
nets_right(4) = [];
nets_right(10:end) = [];
nets_right(8) = [];
nets_right(2) = [];
sum(nets_right)
total_vars = 254;
for net = 1:length(nets_left)
perc = nets_right(net)/total_vars
end
for net = 1:16
nets_right(net) = length(find(RH_cluster_onRH.vars(:,3)==net));
end
nets_right(6) = [];
nets_right(4) = [];
nets_right(10:end) = [];
nets_right(8) = [];
nets_right(2) = [];
sum(nets_right)
total_vars = 541;
for net = 1:length(nets_left)
perc = nets_right(net)/total_vars
end
for net = 1:16
nets_right(net) = length(find(RH_cluster_onRH.vars(:,3)==net));
end
nets_right(6) = [];
nets_right(4) = [];
nets_right(10:15) = [];
nets_right(8) = [];
nets_right(2) = [];
for net = 1:16
nets_right(net) = length(find(RH_cluster_onRH.vars(:,3)==net));
end
nets_right(6) = [];
nets_right(4) = [];
nets_right(8) = [];
nets_right(2) = [];
nets_right(9:11) = [];
for net = 1:length(nets_left)
perc = nets_right(net)/total_vars
end
total_vars = sum(nets_right);
for net = 1:length(nets_right)
perc = nets_right(net)/total_vars
end
for net = 1:16
nets_right(net) = length(find(RH_cluster_onLH.vars(:,3)==net));
end
nets_right(6) = [];
nets_right(4) = [];
nets_right(8) = [];
nets_right(2) = [];
total_vars = sum(nets_right);
for net = 1:length(nets_right)
perc = nets_right(net)/total_vars
```

```
end
clear all
load↙
('/Users/dianaperez/Desktop/Thesis/Variant_Properties/HCP384_new_split_variants_info_wSur↙
fArea.mat')
bordervars_LH = variants_info.left_hem.indiv_vars(variants_info.left_hem.↙
indiv_vars==1,:);
bordervars_LH = variants_info.left_hem.indiv_vars(variants_info.left_hem.indiv_vars=1,:);
bordervars_LH = variants_info.left_hem.indiv_vars(variants_info.left_hem.indiv_vars(:,5)↙
==1,:);
bord_ectop = variants_info.left_hem.indiv_vars{:,5};
bordervars_LH = variants_info.left_hem.indiv_vars(bord_ectop==1,:);
ectopicvars_LH = variants_info.left_hem.indiv_vars(bord_ectop==2,:);
bord_ectop1 = variants_info.right_hem.indiv_vars{:,5};
bordervars_RH = variants_info.right_hem.indiv_vars(bord_ectop==1,:);
bordervars_RH = variants_info.right_hem.indiv_vars(bord_ectop1==1,:);
ectopicvars_RH = variants_info.right_hem.indiv_vars(bord_ectop1==2,:);
clear bord_ectop
clear bord_ectop1
numperms = 1000;
left = bordervars_LH;
right = bordervars_RH;
flip_switch = zeros(length(left)+length(right),1);
flip_switch = zeros(height(left)+height(right),1);
flip_switch(1:length(flip_switch)/2) = 1;
true_mean_LH = mean(left);
true_mean_LH = mean(left{:,5});
true_mean_RH = mean(right{:,5});
true_diff = true_mean_LH - true_mean_RH;
surfArea_LH = left{:,5};
surfArea_RH = right{:,5};
for p = 1:numperms
rng('shuffle');
ind = randperm(length(flip_switch))';
rand_flip_switch = flip_switch(ind);
for s = 1:length(flip_switch)
end
end
variable = [surfArea_LH; surfArea_RH];
flip_switch = zeros(height(left)+height(right),1);
flip_switch(1:length(surfArea_LH)/2) = 1;
clear all
if rand_flip_switch(s) == 1
pseudo_left(s,1) = left(s);
pseudo_right(s,1) = right(s);
elseif rand_flip_switch(s) == 0
pseudo_right(s,1) = left(s);
pseudo_left(s,1) = right(s);
end
end
perm_diffs(p) = mean(pseudo_left - pseudo_right);
end
end
load↙
('/Users/dianaperez/Desktop/Thesis/Variant_Properties/HCP384_new_split_variants_info_wSur↙
fArea.mat')
bord_ectop = variants_info.left_hem.indiv_vars{:,5};
bordervars_LH = variants_info.left_hem.indiv_vars(bord_ectop==1,:);
ectopicvars_LH = variants_info.left_hem.indiv_vars(bord_ectop==2,:);
bord_ectop1 = variants_info.right_hem.indiv_vars{:,5};
```

```
bordervars_RH = variants_info.right_hem.indiv_vars(bord_ectop1==1,:);
ectopicvars_RH = variants_info.right_hem.indiv_vars(bord_ectop1==2,:);
numperms = 1000;
left = bordervars_LH{:,5};
right = bordervars_RH{:,5};
true_diff = mean(left)- mean(right);
flip_switch = zeros(length(left)+length(right),1);
flip_switch(1:length(left)/2) = 1;
all = [left; right];
for p = 1:numperms
rng('shuffle');
ind = randperm(length(flip_switch))';
rand_flip_switch = flip_switch(ind);
pseudo_left = [];
pseudo_right = [];
for s = 1:length(all)
if rand_flip_switch(s) == 1
pseudo_left = [pseudo_left; all(s)];
elseif rand_flip_switch(s) == 0
pseudo_right(s,1) = [pseudo_right; all(s)];
end
end
perm_diffs(p) = mean(pseudo_left - pseudo_right);
end
permute_bord_ectop_size_byHem
p = length(find(perm_diffs<true_diff))
p = length(find(perm_diffs>true_diff))
left = ectopicvars_LH{:,3};
right = ectopicvars_RH{:,3};
true_diff = mean(left)- mean(right);
flip_switch = zeros(length(left)+length(right),1);
flip_switch(1:length(left)/2) = 1;
all = [left; right];
for p = 1:numperms
rng('shuffle');
ind = randperm(length(flip_switch))';
rand_flip_switch = flip_switch(ind);
pseudo_left = [];
pseudo_right = [];
for s = 1:length(all)
if rand_flip_switch(s) == 1
pseudo_left = [pseudo_left; all(s)];
elseif rand_flip_switch(s) == 0
pseudo_right = [pseudo_right; all(s)];
end
end
perm_diffs(p) = mean(pseudo_left) - mean(pseudo_right);
end
p = length(find(perm_diffs<true_diff))
clear all
load↙
('/Users/dianaperez/Desktop/Thesis/Variant_Properties/Permutation_Tests/HCP384_LhemvsRhem↙
_num_vars.mat')
clear all
load↙
('/Users/dianaperez/Desktop/Thesis/Variant_Properties/Permutation_Tests/HCP384_LhemvsRhem↙
_num_vars.mat')
clear output_mat
ind = zeros(1001,1);
ind(1,1) = 1;
```

```
handles = plotSpread(perms_varSize, 'categoryMarkers', {'o', '.'}, 'categoryLabels',↙
{'Permuted Correlations','True Correlation'}, 'categoryColors', {'k','r'}, 'categoryIdx',↙
[ind], 'xNames', {'Average Variant Size'}, 'xValues', [1])
scatter(1,perms_varSize(1,:), 'MarkerEdgeColor', 'red', 'MarkerFaceColor', 'red',↙
'SizeData', 50)
ax = gca;
ax.FontSize = 24;
axis([0.5, 1.5, -60, 20])
handles = plotSpread(perms_varSize, 'categoryMarkers', {'o', '.'}, 'categoryLabels',↙
{'Permuted Correlations','True Correlation'}, 'categoryColors', {'k','r'}, 'categoryIdx',↙
[ind], 'xNames', {'Number of Variants'}, 'xValues', [1])
load↙
('/Users/dianaperez/Desktop/Thesis/Variant_Properties/Permutation_Tests/HCP384_LhemvsRhem↙
_num_vars.mat')
perms_numVars = output_mat;
clear output_mat
handles = plotSpread(perms_numVars, 'categoryMarkers', {'o', '.'}, 'categoryLabels',↙
{'Permuted Correlations','True Correlation'}, 'categoryColors', {'k','r'}, 'categoryIdx',↙
[ind], 'xNames', {'Number of Variants'}, 'xValues', [1])
scatter(1,perms_numVars(1,:), 'MarkerEdgeColor', 'red', 'MarkerFaceColor', 'red',↙
'SizeData', 50)
ax = gca;
ax.FontSize = 24;
axis([0.5, 1.5, -60, 20])
ylabel('Difference in Number of Variants')
handles = plotSpread(perms_numVars, 'categoryMarkers', {'o', '.'}, 'categoryLabels',↙
{'Permuted Correlations','True Correlation'}, 'categoryColors', {'k','r'}, 'categoryIdx',↙
[ind], 'xNames', {'Number of Variants'}, 'xValues', [1])
scatter(1,perms_numVars(1,:), 'MarkerEdgeColor', 'red', 'MarkerFaceColor', 'red',↙
'SizeData', 50)
ax = gca;
ax.FontSize = 24;
axis([0.5, 1.5, -60, 20])
ylabel('Difference in Number of Variants')
close gcf
clear all
load↙
('/Users/dianaperez/Desktop/Thesis/Variant_Properties/HCP384_new_split_variants_info_wSur↙
fArea.mat')
numVarsLH = variants_info.left_hem.group_avg{:,1};
numVarsRH = variants_info.right_hem.group_avg{:,1};
leftHem = numVarsLH;
rightHem = numVarsRH;
[h,mu,sigma,q,notch] = al_goodplot(leftHem,[0],.2,[ 0    0.4470    0.7410],'left');
[h,mu,sigma,q,notch] = al_goodplot(rightHem,[0.1],.2,[0.8500    0.3250↙
0.0980],'right'); % red-ish
close gcf
[h,mu,sigma,q,notch] = al_goodplot(leftHem,[0],.2,[ 0    0.4470    0.7410],'left');
[h,mu,sigma,q,notch] = al_goodplot(rightHem,[0.01],.2,[0.8500    0.3250↙
0.0980],'right'); % red-ish
xticks([0.105])
xticklabels('Number of Variants')
axis([-0.2, 0.5, 100, 800])
ax = gca;
ax.FontSize = 24;
close gcf
[h,mu,sigma,q,notch] = al_goodplot(leftHem,[0],.2,[ 0    0.4470    0.7410],'left');
[h,mu,sigma,q,notch] = al_goodplot(rightHem,[0.01],.2,[0.8500    0.3250↙
0.0980],'right'); % red-ish
xticks([0.105])
```

```
xticklabels('Number of Variants')
xticks([0.005])
ax = gca;
ax.FontSize = 24;
axis([-0.2, 0.5, -5, 25])
axis([-0.2, 0.2, -5, 25])
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.3, 0.7]); %first and second↙
control position on screen, third controls width, and fourth controls height
print(gcf, '/Users/dianaperez/Desktop/FigureforPres_numVars_HCP.jpg', '-dpng', '-r300')
numBorderLH = variants_info.left_hem.group_avg{:,4};
numBorderRH = variants_info.right_hem.group_avg{:,4};
numEctopicLH = variants_info.left_hem.group_avg{:,5};
numEctopicRH = variants_info.right_hem.group_avg{:,5};
leftHem = [numBorderLH numEctopicLH];
rightHem = [numBorderRH numEctopicRH];
[h,mu,sigma,q,notch] = al_goodplot(leftHem,[-1,0,1],.2,[ 0    0.4470    0.7410],'left');
[h,mu,sigma,q,notch] = al_goodplot(leftHem,[-1,1],.2,[ 0    0.4470    0.7410],'left');
numBorderLH = variants_info.left_hem.group_avg{:,5};
numBorderRH = variants_info.right_hem.group_avg{:,5};
numEctopicLH = variants_info.left_hem.group_avg{:,7};
numEctopicRH = variants_info.right_hem.group_avg{:,7};
leftHem = [numBorderLH numEctopicLH];
rightHem = [numBorderRH numEctopicRH];
[h,mu,sigma,q,notch] = al_goodplot(leftHem,[-1,1],.2,[ 0    0.4470    0.7410],'left');
[h,mu,sigma,q,notch] = al_goodplot(rightHem,[-1,1],.2,[0.8500    0.3250↙
0.0980],'right'); % red-ish
close gcf
[h,mu,sigma,q,notch] = al_goodplot(leftHem,[-1,0],.2,[ 0    0.4470    0.7410],'left');
[h,mu,sigma,q,notch] = al_goodplot(rightHem,[-1,0],.2,[0.8500    0.3250↙
0.0980],'right'); % red-ish
close gcf
[h,mu,sigma,q,notch] = al_goodplot(rightHem,[-1,-.6],.2,[0.8500    0.3250↙
0.0980],'right'); % red-ish
[h,mu,sigma,q,notch] = al_goodplot(leftHem,[-1,-.6],.2,[ 0    0.4470    0.7410],'left');
ax = gca;
ax.FontSize = 24;
ylabel('Number of Variants')
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.5, 0.7]); %first and second↙
control position on screen, third controls width, and fourth controls height
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.3, 0.7]); %first and second↙
control position on screen, third controls width, and fourth controls height
xticklabels({'Border Shifts', 'Ectopic Intrusions'})
xticks([-1,-.6])
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.4, 0.7]); %first and second↙
control position on screen, third controls width, and fourth controls height
print(gcf, '/Users/dianaperez/Desktop/FigureforPres_bordEctopic_HCP.jpg', '-dpng', '-↙
r300')
ft_read_cifti_mod↙
('/Users/dianaperez/Desktop/Thesis/old_Stuff/newsplit_vs_oldsplit_comparison/571144_Thres↙
holdedVariantMap_SNRExclude_networksAssigned_10.dtseries.nii')
cifti = ans;
bin_cifti = logical(cifti.data);
unique(bin_cifti)
template = cifti;
template.data = bin_cifti;
ft_write_cifti_mod('/Users/dianaperez/Desktop/binarized_varmap_HCPsub571144.dtseries.↙
nii', template)
ft_read_cifti_mod↙
('/Users/dianaperez/Desktop/Thesis/old_Stuff/newsplit_vs_oldsplit_comparison/571144_reass↙
igned.dtseries.nii')
```

```
cifti = ans;
find(cifti.data==11)
unique(cifti.data)
ft_read_cifti_mod↙
('/Volumes/RESEARCH_HD/HCP_Variants/new_split_vars/571144_revised_uniqueIDs_minsize30.↙
dtseries.nii')
cifti = ans;
find(cifti.data==11)
verts = ans;
verts_var_11 = ans;
verts_var_10 = find(cifti.data==10);
bin_cifti = zeroes(size(cifti.data));
bin_cifti = zeros(size(cifti.data));
bin_cifti(verts_var_10) = 1;
bin_cifti(verts_var_11) = 1;
template.data = bin_cifti;
ft_write_cifti_mod('/Users/dianaperez/Desktop/binarized_varmap_HCPsub571144_splitvars.↙
dtseries.nii', template)
bin_cifti(verts_var_10) = 7;
template.data = bin_cifti;
ft_write_cifti_mod↙
('/Users/dianaperez/Desktop/binarized_varmap_HCPsub571144_splitvars_var10_lang.dtseries.↙
nii', template)
bin_cifti(verts_var_10) = 1;
bin_cifti(verts_var_11) = 7;
template.data = bin_cifti;
ft_write_cifti_mod↙
('/Users/dianaperez/Desktop/binarized_varmap_HCPsub571144_splitvars_var11_lang.dtseries.↙
nii', template)
cifti = ft_read_cifti_mod↙
('/Users/dianaperez/Desktop/Thesis/old_Stuff/newsplit_vs_oldsplit_comparison/571144_Thres↙
holdedVariantMap_SNRExclude_networksAssigned_10.dtseries.nii')
bin_cifti = zeroes(size(cifti.data));
bin_cifti = zeros(size(cifti.data));
verts = find(cifti.data==24);
bin_cifti(verts) = 1;
template.data= bin_cifti;
ft_write_cifti_mod('/Users/dianaperez/Desktop/binarized_varmap_HCPsub571144_bigVarOnly.↙
dtseries.nii', template)
unique(cifti.data)
%-- 10/19/21, 11:58 AM --%
load↙
('/Users/dianaperez/Box/Research/Lateralization_thresh10/subjectData/goodSubs_addtlinfo.↙
mat')
lang_scores = HCP_goodSubs{2:end,5};
lang_scores = HCP_goodSubs{:,5};
HCP_goodSubs{:,5}
HCP_goodSubs{5}
HCP_goodSubs{1:384,5}
lang_scores = cell2mat(HCP_goodSubs{2:end,5});
lang_scores = cell2mat(HCP_goodSubs{:,5});
lang_scores = HCP_goodSubs1{2:end};
lang_scores = cell2mat(HCP_goodSubs1{2:end});
load↙
('/Users/dianaperez/Desktop/Thesis/Variant_Properties/HCP384_new_split_variants_info_wSur↙
fArea.mat')
sub = 2;
lang_scores = [];
for s = 1:384
lang_scores(s,1) = cell2mat(HCP_goodSubs{sub,5};
```

```
sub = sub+1;
end
sub = 2;
lang_scores = [];
for s = 1:384
lang_scores(s,1) = cell2mat(HCP_goodSubs{sub,5});
sub = sub+1;
end
lang_scores = cell2mat(HCP_goodSubs1(2:end));
clear HCP_goodSubs1
clear s sub ans
numVars = variants_info.left_hem.group_avg{1,1};
diff_score = variants_info.left_hem.group_avg{1,1} - variants_info.right_hem.group_avg↙
{1,1}
diff_scores = variants_info.left_hem.group_avg{:,1} - variants_info.right_hem.group_avg↙
{:,1};
corr(lang_scores, diff_scores)
corrcoeff(lang_scores, diff_scores)
corrcoef(lang_scores, diff_scores)
find(isnan(diff_scores)
find(isnan(diff_scores))
find(isnan(lang_scores))
backup = [lang_scores diff_scores];
backup(ans,:) = [];
find(isnan(backup))
lang_scores(nans,:) = [];
diff_scores(nans,:) = [];
nans = find(isnan(lang_scores));
lang_scores(nans,:) = [];
diff_scores(nans,:) = [];
corrcoef(lang_scores, diff_scores)
[R P] = corrcoef(lang_scores, diff_scores)
diff_scores = variants_info.left_hem.group_avg{:,2} - variants_info.right_hem.group_avg↙
{:,2};
diff_scores(nans,:) = [];
[R P] = corrcoef(lang_scores, diff_scores)
diff_scores = variants_info.left_hem.group_avg{:,3} - variants_info.right_hem.group_avg↙
{:,3};
diff_scores(nans,:) = [];
[R P] = corrcoef(lang_scores, diff_scores)
diff_scores = variants_info.left_hem.group_avg{:,4} - variants_info.right_hem.group_avg↙
{:,4};
diff_scores(nans,:) = [];
[R P] = corrcoef(lang_scores, diff_scores)
diff_scores = variants_info.left_hem.group_avg{:,1} - variants_info.right_hem.group_avg↙
{:,1};
diff_scores(nans,:) = [];
[R P] = corrcoef(lang_scores, diff_scores);
plot(lang_scores, diff_scores)
scatter(lang_scores,diff_scores)
clear all
ft_read_cifti_mod↙
('/Users/dianaperez/Downloads/VariantSplittingFiles/variantsPCA_allSubs_HCPfull_topEigenv↙
alue.dtseries.nii')
load↙
('/Users/dianaperez/Box/Research/Lateralization_thresh10/subjectData/goodSubs_addtlinfo.↙
mat')
lang_scores = cell2mat(HCP_goodSubs1(2:end));
load↙
('/Users/dianaperez/Desktop/Thesis/Variant_Properties/HCP384_new_split_variants_info_wSur↙
```

```
fArea.mat')
diff_scores = variants_info.left_hem.group_avg{:,1} - variants_info.right_hem.group_avg↙
{:,1};
nans = find(isnan(lang_scores));
lang_scores(nans,:) = [];
diff_scores(nans,:) = [];
[R P] = corrcoef(lang_scores, diff_scores);
diff_scores = variants_info.left_hem.group_avg{:,2} - variants_info.right_hem.group_avg↙
{:,2};
%-- 10/25/21, 12:04 PM --%
load('/Users/dianaperez/Desktop/Thesis/Variant_Properties/HCP384_new_split_variants_info.↙
mat')
numVarsLH = variants_info.left_hem.group_avg{:,1};
numVarsRH = variants_info.right_hem.group_avg{:,1};
leftHem = numVarsLH;
rightHem = numVarsRH;
[h,mu,sigma,q,notch] = al_goodplot(leftHem,.1,.2,[ 0    0.4470    0.7410],'left');
addpath '/Users/dianaperez/Documents/MATLAB/upload'
[h,mu,sigma,q,notch] = al_goodplot(rightHem,0.11,.2,[0.8500    0.3250↙
0.0980],'right');
xticks([0.105])
[h,mu,sigma,q,notch] = al_goodplot(leftHem,0.1,.2,[ 0    0.4470    0.7410],'left');
xticklabels('Number of Variants')
axis([-0.2, 0.5, 0, 20])
axis([-0.2, 0.5, 2, 20])
ax = gca;
ax.FontSize = 24;
xticklabels('Variant Frequency Across Hemispheres')
ylabel('Number of Variant Regions')
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.3, 0.7]); %first and second↙
control position on screen, third controls width, and fourth controls height
print(gcf, '/Users/dianaperez/Desktop/posterfig_numVars_HCP.jpg', '-dpng', '-r300')
axis([-0.2, 0.5, 0, 20])
print(gcf, '/Users/dianaperez/Desktop/posterfig_numVars_HCP.jpg', '-dpng', '-r300')
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.3, 0.9]); %first and second↙
control position on screen, third controls width, and fourth controls height
print(gcf, '/Users/dianaperez/Desktop/posterfig_numVars_HCP.jpg', '-dpng', '-r300')
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.3, 0.75]); %first and↙
second control position on screen, third controls width, and fourth controls height
print(gcf, '/Users/dianaperez/Desktop/posterfig_numVars_HCP.jpg', '-dpng', '-r300')
xticklabels('Number of Variants')
print(gcf, '/Users/dianaperez/Desktop/posterfig_numVars_HCP.jpg', '-dpng', '-r300')
operc_cluster
addpath '/Users/dianaperez/Documents/GitHub/Lateralization_Variants/thesis_scripts'
operc_cluster
output_dir = '/Users/dianaperez/Desktop/Thesis/Spatial_Location/';
load([output_dir 'operc_nets_lefthemcluster_righthem.mat']);
leftclust_righthem = LH_cluster;
load([output_dir 'operc_nets_lefthemcluster_lefthem.mat']);
leftclust_lefthem = LH_cluster;
clear LH_cluster
clear all
output_dir = '/Users/dianaperez/Desktop/Thesis/Spatial_Location/';
load([output_dir 'operc_nets_lefthemcluster_righthem.mat']);
leftclust_righthem = LH_cluster;
load([output_dir 'operc_nets_lefthemcluster_lefthem.mat']);
leftclust_lefthem = LH_cluster;
clear LH_cluster
for net = 1:16
nets_left(net) = length(find(leftclust_lefthem.number(:,3)==net));
```

```
end
length(find(leftclust_lefthem.number(:,3)==7))
for net = 1:16
nets_left(net) = length(find(leftclust_lefthem.vars(:,3)==net));
end
for net = 1:16
nets_right(net) = length(find(leftclust_righthem.vars(:,3)==net));
end
network_names = {'DMN'  'Vis'   'FP'    'DAN'   'Lang'  'CO'    'SMd'   'Aud'   'PON'};
nets_left(13:15) = [];
nets_left(11) = [];
nets_left(8) = [];
nets_left(6) = [];
nets_left(4) = [];
t = tiledlayout(1,2,'TileSpacing', 'compact');
ax1 = nexttile;
h = pie(ax1,nets_left, network_names);
title('Left Hem')
patchHandle = findobj(h, 'Type', 'Patch');
set(patchHandle, {'FaceColor'}, mat2cell(rgb_colors, ones(size(rgb_colors,1),1),3))
rgb_colors = [1 0 0;    %DMN
0 0 .6; %Vis
1 1 0; %FP
0 .8 0; %DAN
0 .6 .6;%VAN
.3 0 .6;%CON
.2 1 1;%SMd
.6 .2 1;%Aud
.8 .8 .6]; %PON
t = tiledlayout(1,2,'TileSpacing', 'compact');
ax1 = nexttile;
h = pie(ax1,nets_left, network_names);
title('Left Hem')
patchHandle = findobj(h, 'Type', 'Patch');
set(patchHandle, {'FaceColor'}, mat2cell(rgb_colors, ones(size(rgb_colors,1),1),3))
nets_right(13:15) = [];
nets_right(11) = [];
nets_right(8) = [];
nets_right(6) = [];
nets_right(4) = [];
ax2 = nexttile;
h = pie(ax2,nets_right, network_names);
title('Right Hem')
patchHandle = findobj(h, 'Type', 'Patch');
set(patchHandle, {'FaceColor'}, mat2cell(rgb_colors, ones(size(rgb_colors,1),1),3))
labels_legend = {'Default Mode', 'Visual', 'Frontoparietal', 'Dorsal Attention',↙
'Language', 'Cingulo-opercular',  'Somatomotor Dorsal', 'Auditory', 'Parietal↙
Occipital'};
lgd = legend(labels_legend);
lgd.Layout.Tile = 'east';
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.9, 0.7]); %first and second↙
control position on screen, third controls width, and fourth controls height
ax1.FontSize = 24;
lgd.FontSize = 24
ax2.FontSize = 24;
print(gcf,↙
'/Users/dianaperez/Desktop/Thesis/Figures/Figure7_pieChart_operc_cluster_networks_lefthem↙
_HCP.jpg', '-dpng', '-r300')
output_dir = '/Users/dianaperez/Desktop/Thesis/Spatial_Location/';
load([output_dir 'operc_nets_righthemcluster_righthem.mat']);
```

```
rightclust_righthem = RH_cluster;
load([output_dir 'operc_nets_righthemcluster_lefthem.mat']);
rightclust_lefthem = RH_cluster;
clear RH_cluster
for net = 1:16
nets_left(net) = length(find(rightclust_lefthem.vars(:,3)==net));
end
for net = 1:16
nets_right(net) = length(find(rightclust_righthem.vars(:,3)==net));
end
network_names = {'DMN'  'Vis'   'FP'    'DAN'   'Lang'  'CO'    'SMd'   'Aud'   'PON'};
nets_left(13:15) = [];
nets_left(11) = [];
nets_left(8) = [];
nets_left(6) = [];
nets_left(4) = [];
for net = 1:16
nets_left(net) = length(find(rightclust_lefthem.vars(:,3)==net));
end
rgb_colors = [1 0 0;
1 1 0;
0 .8 0;
0 .6 .6;
0 0 0;
.3 0 .6;
1 .5 0;
.8 .8 .6;];
output_dir = '/Users/dianaperez/Desktop/Thesis/Spatial_Location/';
load([output_dir 'operc_nets_righthemcluster_righthem.mat']);
rightclust_righthem = RH_cluster;
load([output_dir 'operc_nets_righthemcluster_lefthem.mat']);
rightclust_lefthem = RH_cluster;
clear RH_cluster
network_names = {'DMN'  'FP' 'DAN' 'Lang'   'Sal'   'CO'    'SMl' 'PON'};
for net = 1:16
nets_left(net) = length(find(rightclust_lefthem.vars(:,3)==net));
end
nets_left(12:16) = [];
nets_left(10) = [];
nets_left(6) = [];
nets_left(4) = [];
nets_left(2) = [];
t = tiledlayout(1,2,'TileSpacing', 'compact');
ax1 = nexttile;
h = pie(ax1,nets_left, network_names);
title('Left Hem')
patchHandle = findobj(h, 'Type', 'Patch');
set(patchHandle, {'FaceColor'}, mat2cell(rgb_colors, ones(size(rgb_colors,1),1),3))
for net = 1:16
nets_left(net) = length(find(rightclust_lefthem.vars(:,3)==net));
end
nets_left(12:15) = [];
nets_left(10) = [];
nets_left(6) = [];
nets_left(4) = [];
nets_left(2) = [];
t = tiledlayout(1,2,'TileSpacing', 'compact');
ax1 = nexttile;
h = pie(ax1,nets_left, network_names);
title('Left Hem')
```

```
patchHandle = findobj(h, 'Type', 'Patch');
set(patchHandle, {'FaceColor'}, mat2cell(rgb_colors, ones(size(rgb_colors,1),1),3))
for net = 1:16
nets_right(net) = length(find(rightclust_righthem.number(:,3)==net));
end
for net = 1:16
nets_right(net) = length(find(rightclust_righthem.vars(:,3)==net));
end
nets_right(12:15) = [];
nets_left(10) = [];
nets_left(6) = [];
nets_left(4) = [];
nets_left(2) = [];
ax2 = nexttile;
h = pie(ax2,nets_right, network_names);
title('Right Hem')
patchHandle = findobj(h, 'Type', 'Patch');
set(patchHandle, {'FaceColor'}, mat2cell(rgb_colors, ones(size(rgb_colors,1),1),3))
labels_legend = {'Default Mode' 'Frontoparietal', 'Dorsal Attention', 'Language',↙
'Salience', 'Cingulo-Opercular',  'Somatomotor Ventral' 'Parieto-Occipital'};
lgd = legend(labels_legend);
lgd.Layout.Tile = 'east';
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.9, 0.7]); %first and second↙
control position on screen, third controls width, and fourth controls height
ax1.FontSize = 24;
ax2.FontSize = 24;
lgd.FontSize = 24;
nets_right(12:15) = [];
nets_right(10) = [];
nets_right(6) = [];
nets_right(4) = [];
nets_right(2) = [];
for net = 1:16
nets_right(net) = length(find(rightclust_righthem.vars(:,3)==net));
end
nets_right(12:15) = [];
nets_right(10) = [];
nets_right(6) = [];
nets_right(4) = [];
nets_right(2) = [];
ax2 = nexttile;
h = pie(ax2,nets_right, network_names);
title('Right Hem')
patchHandle = findobj(h, 'Type', 'Patch');
set(patchHandle, {'FaceColor'}, mat2cell(rgb_colors, ones(size(rgb_colors,1),1),3))
labels_legend = {'Default Mode' 'Frontoparietal', 'Dorsal Attention', 'Language',↙
'Salience', 'Cingulo-Opercular',  'Somatomotor Ventral' 'Parieto-Occipital'};
lgd = legend(labels_legend);
lgd.Layout.Tile = 'east';
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.9, 0.7]); %first and second↙
control position on screen, third controls width, and fourth controls height
ax1.FontSize = 24;
ax2.FontSize = 24;
lgd.FontSize = 24;
print(gcf,↙
'/Users/dianaperez/Desktop/Thesis/Figures/Figure7_pieChart_operc_cluster_networks_righthe↙
m_HCP.jpg', '-dpng', '-r300')
sum(nets_left)
for n = 1:length(nets_left)
proportion(n) = nets_left(n)/sum(nets_left);
```

```
end
for net = 1:16
nets_right(net) = length(find(leftclust_righthem.vars(:,3)==net));
end
nets_right(13:15) = [];
nets_right(11) = [];
nets_right(8) = [];
nets_right(6) = [];
nets_right(4) = [];
for n = 1:length(nets_right)
proportion(n) = nets_right(n)/sum(nets_right);
end
sum(nets_right)
network_names = {'DMN'  'Vis'   'FP'    'DAN'   'Lang'  'CO'    'SMd'   'Aud'   'PON'};
for net = 1:16
nets_left(net) = length(find(leftclust_lefthem.vars(:,3)==net));
end
nets_left(13:15) = [];
nets_left(11) = [];
nets_left(8) = [];
nets_left(6) = [];
nets_left(4) = [];
sum(nets_left)
for n = 1:length(nets_left)
proportion(n) = nets_left(n)/sum(nets_left);
end
for net = 1:16
nets_right(net) = length(find(rightclust_righthem.vars(:,3)==net));
end
nets_right(12:15) = [];
nets_right(10) = [];
nets_right(6) = [];
nets_right(4) = [];
nets_right(2) = [];
sum(nets_right)
for n = 1:length(nets_right)
proportion(n) = nets_right(n)/sum(nets_right);
end
%-- 10/30/21, 6:39 PM --%
permute_variantproperties
%-- 10/31/21, 7:17 PM --%
permute_variantproperties
avgSurfArea = allSubs_info.variants_info.left_hem.group_avg{:,4};
avgSurfArea = mean(allSubs_info.variants_info.left_hem.group_avg{:,4});
avgSurfArea_RH = mean(allSubs_info.variants_info.right_hem.group_avg{:,4})
disp(['Hemisphere X Handedness, Average Variant Surface Area (permute handedness) -↙
Below: ' num2str(length(find(perm_diffs<true_diff))/numperms)])
disp(['Hemisphere X Handedness, Average Variant Surface Area (permute handedness) -↙
Above: ' num2str(length(find(perm_diffs>true_diff))/numperms)])
true_diff = perm_diffs(1);
perm_diffs = perm_diffs(2:end);
disp(['Hemisphere X Handedness, Average Variant Surface Area (permute handedness) -↙
Below: ' num2str(length(find(perm_diffs<true_diff))/numperms)])
disp(['Hemisphere X Handedness, Average Variant Surface Area (permute handedness) -↙
Above: ' num2str(length(find(perm_diffs>true_diff))/numperms)])
[true_diff perm_diffs] = permute_values(allSubs_info.variants_info.left_hem.group_avg{:,↙
4}, allSubs_info.variants_info.right_hem.group_avg{:,4}, flip_switch, numperms, 0, 1, 0);
disp(['Average Variant Size (permute hemispheres) - Below: ' num2str(length(find↙
(perm_diffs<true_diff))/1000)])
disp(['Average Variant Size (permute hemispheres) - Above: ' num2str(length(find↙
```

```
(perm_diffs>true_diff))/1000)])
permute_variantproperties
save([outputDir str 'surf_area_proportion.mat'], 'output_mat');
check_MRI_data
pwd
dcm_dir = '/Volumes/fsmresfiles/PBS/Gratton_Lab/Lifespan/Post-COVID/BIDS/DICOM';
cd dcm_dir
cd ~/
clear all
load('/Volumes/fsmresfiles/PBS/Gratton_Lab/Lifespan/Post-↙
COVID/BIDS/derivatives/preproc_FCProc/corrmats_Seitzman300/sub-LS02/sub-LS02_sess-1_task-↙
rest_corrmat_Seitzman300.mat')
LS02_ses-1 = corrmat;
LS02_ses1 = corrmat;
load('/Volumes/fsmresfiles/PBS/Gratton_Lab/Lifespan/Post-↙
COVID/BIDS/derivatives/preproc_FCProc/corrmats_Seitzman300/sub-LS02/sub-LS02_sess-2_task-↙
rest_corrmat_Seitzman300.mat')
LS02_ses2 = corrmat;
load('/Volumes/fsmresfiles/PBS/Gratton_Lab/Lifespan/Post-↙
COVID/BIDS/derivatives/preproc_FCProc/corrmats_Seitzman300/sub-LS02/sub-LS02_sess-3_task-↙
rest_corrmat_Seitzman300.mat')
LS02_ses3 = corrmat;
load('/Volumes/fsmresfiles/PBS/Gratton_Lab/Lifespan/Post-↙
COVID/BIDS/derivatives/preproc_FCProc/corrmats_Seitzman300/sub-LS02/sub-LS02_sess-4_task-↙
rest_corrmat_Seitzman300.mat')
LS02_ses4 = corrmat;
load('/Volumes/fsmresfiles/PBS/Gratton_Lab/Lifespan/Post-↙
COVID/BIDS/derivatives/preproc_FCProc/corrmats_Seitzman300/sub-LS02/sub-LS02_sess-5_task-↙
rest_corrmat_Seitzman300.mat')
LS02_ses5 = corrmat;
corr(LS02_ses1,LS02_ses2)
corrcoef(LS02_ses1,LS02_ses2)
corrs_LS02 = [];
corrs_LS02(1) = corrcoef(LS02_ses1,LS02_ses2);
corrs_LS02(1) = 0.67;
corrcoef(LS02_ses1,LS02_ses3)
corrs_LS02(2) = 0.66;
corrcoef(LS02_ses1,LS02_ses4)
corrs_LS02(3) = 0.66;
corrcoef(LS02_ses1,LS02_ses5)
corrs_LS02(3) = 0.66;
corrs_LS02(4) = 0.66;
corrcoef(LS02_ses2,LS02_ses5)
corrs_LS02(5) = 0.66;
corrcoef(LS02_ses2,LS02_ses4)
corrs_LS02(6) = 0.73;
corrcoef(LS02_ses2,LS02_ses3)
corrs_LS02(7) = 0.73;
corrcoef(LS02_ses3,LS02_ses4)
corrs_LS02(8) = 0.76;
corrcoef(LS02_ses3,LS02_ses5)
corrs_LS02(9) = 0.64;
corrcoef(LS02_ses4,LS02_ses5)
corrs_LS02(10) = 0.66;
mean(corrs_LS02)
clear ans corrmat sess_roi* tmask* LS02*
load('/Volumes/fsmresfiles/PBS/Gratton_Lab/Lifespan/Pre-↙
COVID/BIDS/Nifti/derivatives/preproc_FCProc/corrmats_Seitzman300/sub-LS02/sub-LS02_sess-↙
1_task-rest_corrmat_Seitzman300.mat')
sub = 'LS02';
```

```
pre_dir = '/Volumes/fsmresfiles/PBS/Gratton_Lab/Lifespan/Pre-↙
COVID/BIDS/Nifti/derivatives/preproc_FCProc/corrmats_Seitzman300/';
post_dir = '/Volumes/fsmresfiles/PBS/Gratton_Lab/Lifespan/Post-↙
COVID/BIDS/derivatives/preproc_FCProc/corrmats_Seitzman300/';
pre_sessions = 3;
post_sessions = 5;
for pre_ses = 1:pre_sessions
load([pre_dir 'sub-' sub '/sub-' sub '_sess-' pre_ses '_task-rest_corrmat_Seitzman300.↙
mat'])
corrmats_pre(:,:,pre_ses) = corrmat;
end
for post_ses = 1:post_sessions
load([post_dir 'sub-' sub '/sub-' sub '_sess-' post_ses '_task-rest_corrmat_Seitzman300.↙
mat'])
corrmats_post(:,:,post_ses) = corrmat;
end
%% compare pre and post covid corrmats
sub = 'LS02';
pre_dir = '/Volumes/fsmresfiles/PBS/Gratton_Lab/Lifespan/Pre-↙
COVID/BIDS/Nifti/derivatives/preproc_FCProc/corrmats_Seitzman300/';
post_dir = '/Volumes/fsmresfiles/PBS/Gratton_Lab/Lifespan/Post-↙
COVID/BIDS/derivatives/preproc_FCProc/corrmats_Seitzman300/';
pre_sessions = 3;
post_sessions = 5;
for pre_ses = 1:pre_sessions
load([pre_dir 'sub-' sub '/sub-' sub '_sess-' num2str(pre_ses) '_task-↙
rest_corrmat_Seitzman300.mat'])
corrmats_pre(:,:,pre_ses) = corrmat;
end
for post_ses = 1:post_sessions
load([post_dir 'sub-' sub '/sub-' sub '_sess-' num2str(post_ses) '_task-↙
rest_corrmat_Seitzman300.mat'])
corrmats_post(:,:,post_ses) = corrmat;
end
clear corrmat sess_roi* tmask* LS02*
corr = corrcoef(corrmats_post(:,:,1),corrmats_post(:,:,2));
corr(2)
combos = combntns(1:3,2)
%-- 11/4/21, 5:57 PM --%
combos = combntns(1:3,2)
length(combos)
combos(1,1)
combos(1,2)
combos(2,1)
prevspost_compare
clear all
prevspost_compare
%-- 11/10/21, 6:14 PM --%
rgb_colors = [1 0 0; %DMN
0 0 .6; %Vis
1 1 0; %FP
.67 .67 .67; %Unassigned
0 .8 0; %DAN
.67 .67 .67; %Unassigned2
0 .6 .6;%VAN
0 0 0; % Sal
.3 0 .6; %CON
.2 1 1; %SMd
1 .5 0; % SMl
.6 .2 1; %Aud
```

```
.2 1 .2; %Tpole
0 .2 .4; %MTL
0 0 1; %PMN
.8 .8 .6; %PON
.8 .8 .6]; %PON
network_names = {'DMN'  'Vis'   'FP' 'DAN' 'Lang'   'Sal'   'CO'    'SMd'   'SMl'   'Aud'↙
'Tpole' 'MTL'   'PMN'   'PON'};
rgb_colors = [1 0 0; %DMN
0 0 .6; %Vis
1 1 0; %FP
.67 .67 .67; %Unassigned
0 .8 0; %DAN
.67 .67 .67; %Unassigned2
0 .6 .6;%VAN
0 0 0; % Sal
.3 0 .6; %CON
.2 1 1; %SMd
1 .5 0; % SMl
.6 .2 1; %Aud
.2 1 .2; %Tpole
0 .2 .4; %MTL
0 0 1; %PMN
.8 .8 .6]; %PON
network_names = {'DMN'  'Vis'   'FP' 'Reward' 'DAN' 'Unassigned' 'Lang' 'Sal'   'CO'↙
'SMd'   'SMl'   'Aud'   'Tpole' 'MTL'   'PMN'   'PON'};
load('/Users/dianaperez/Desktop/network_sizes.mat')
LH_vert_prop = size_of_net(:,2);
LH_surf_prop = size_of_net(:,4);
RH_vert_prop = size_of_net(:,6);
RH_surf_prop = size_of_net(:,8);
vert_perc = [LH_vert_prop RH_vert_prop];
surf_perc = [LH_surf_prop RH_surf_prop];
plot(surf_perc)
scatter(surf_perc)
scatter(LH_surf_prop, RH_surf_prop)
scatter(LH_surf_prop, RH_surf_prop, 10, rgb_colors)
scatter(LH_surf_prop, RH_surf_prop, 50, rgb_colors, 'filled')
scatter(LH_surf_prop, RH_surf_prop, 150, rgb_colors, 'filled')
scatter(LH_surf_prop, RH_surf_prop, 100, rgb_colors, 'filled')
help axis
axis([0 0.20 0 0.20])
axis([0 0.18 0 0.18])
refline(1,0)
xlabel('Left Hemisphere')
ylabel('Right Hemisphere')
line = refline(1,0);
line.Color = 'black';
title('Percent surface area by hemisphere')
ax = gca;
ax.FontSize = 24;
m = findobj(gca, 'Type', 'Scatter');
hleg1 = legend(m, network_names, 'Location', 'SouthOutside');
hleg1.FontSize = 14;
scatter(LH_surf_prop, RH_surf_prop, 100, rgb_colors, 'filled')
axis([0 0.18 0 0.18])
m = findobj(gca, 'Type', 'Scatter');
hleg1 = legend(m, network_names, 'Location', 'SouthOutside');
hleg1.FontSize = 14;
m = findobj(gca, 'Type', 'Scatter')
m(1:16)
```

```
scatter(LH_surf_prop, RH_surf_prop, 100, rgb_colors, 'filled')
axis([0 0.18 0 0.18])
legend(network_names)
scatter(LH_surf_prop, RH_surf_prop, 100, rgb_colors, 'filled')
axis([0 0.18 0 0.18])
line = refline(1,0);
xlabel('Left Hemisphere')
ylabel('Right Hemisphere')
title('Percent surface area by hemisphere')
ax = gca;
ax.FontSize = 24;
print(gcf,↙
'/Users/dianaperez/Desktop/Thesis/Figures/Figure1_permutations_scatterplot_HCP.jpg', '-↙
dpng', '-r300')
close gcf
scatter(LH_surf_prop, RH_surf_prop, 100, rgb_colors, 'filled')
axis([0 0.18 0 0.18])
line = refline(1,0);
xlabel('Left Hemisphere')
ylabel('Right Hemisphere')
title('Percent surface area by hemisphere')
ax = gca;
ax.FontSize = 24;
print(gcf, '/Users/dianaperez/Desktop/Thesis/Figures/network_surfarea_groupavg.jpg', '-↙
dpng', '-r300')
scatter(LH_surf_prop, RH_surf_prop, 100, rgb_colors, 'filled')
axis([0 0.18 0 0.18])
line = refline(1,0);
line.Color = 'black';
xlabel('Left Hemisphere')
ylabel('Right Hemisphere')
title('Percent surface area by hemisphere')
ax = gca;
ax.FontSize = 24;
print(gcf, '/Users/dianaperez/Desktop/Thesis/Figures/network_surfarea_groupavg.jpg', '-↙
dpng', '-r300')
scatter(LH_vert_prop, RH_vert_prop, 100, rgb_colors, 'filled')
axis([0 0.18 0 0.18])
line = refline(1,0);
line.Color = 'black';
xlabel('Left Hemisphere')
ylabel('Right Hemisphere')
title('Percent number of vertices by hemisphere')
ax = gca;
ax.FontSize = 24;
print(gcf, '/Users/dianaperez/Desktop/Thesis/Figures/network_numverts_groupavg.jpg', '-↙
dpng', '-r300')
scatter(LH_surf_prop, RH_surf_prop, 80, rgb_colors, 'filled')
axis([0 0.18 0 0.18])
line = refline(1,0);
line.Color = 'black';
xlabel('Left Hemisphere')
ylabel('Right Hemisphere')
title('Percent surface area by hemisphere')
% ax = gca;
% ax.FontSize = 24;
print(gcf, '/Users/dianaperez/Desktop/Thesis/Figures/network_surfarea_groupavg.jpg', '-↙
dpng', '-r300')
scatter(LH_vert_prop, RH_vert_prop, 80, rgb_colors, 'filled')
axis([0 0.18 0 0.18])
```

```
line = refline(1,0);
line.Color = 'black';
xlabel('Left Hemisphere')
ylabel('Right Hemisphere')
title('Percent number of vertices by hemisphere')
% ax = gca;
% ax.FontSize = 24;
print(gcf, '/Users/dianaperez/Desktop/Thesis/Figures/network_numverts_groupavg.jpg', '-↙
dpng', '-r300')
scatter(LH_surf_prop, RH_surf_prop, 80, rgb_colors, 'filled')
axis([0 0.18 0 0.18])
line = refline(1,0);
line.Color = 'black';
xlabel('Left Hemisphere')
ylabel('Right Hemisphere')
title('Percent surface area by hemisphere')
ax = gca;
ax.FontSize = 24;
print(gcf, '/Users/dianaperez/Desktop/Thesis/Figures/network_surfarea_groupavg.jpg', '-↙
dpng', '-r300')
clear all
network_names = {'DMN'  'Vis'   'FP' 'Reward' 'DAN' 'Unassigned' 'Lang' 'Sal'   'CO'↙
'SMd'   'SMl'   'Aud'   'Tpole' 'MTL'   'PMN'   'PON'};
rgb_colors = [1 0 0; %DMN
0 0 .6; %Vis
1 1 0; %FP
.67 .67 .67; %Unassigned
0 .8 0; %DAN
.67 .67 .67; %Unassigned2
0 .6 .6;%VAN
0 0 0; % Sal
.3 0 .6; %CON
.2 1 1; %SMd
1 .5 0; % SMl
.6 .2 1; %Aud
.2 1 .2; %Tpole
0 .2 .4; %MTL
0 0 1; %PMN
.8 .8 .6]; %PON
% load the matrix with sizes
load('/Users/dianaperez/Desktop/MSC_network_sizes.mat')
LH_vert_prop = size_of_net(:,2);
LH_surf_prop = size_of_net(:,4);
RH_vert_prop = size_of_net(:,6);
RH_surf_prop = size_of_net(:,8);
scatter(LH_surf_prop, RH_surf_prop, 80, rgb_colors, 'filled')
axis([0 0.18 0 0.18])
line = refline(1,0);
line.Color = 'black';
xlabel('Left Hemisphere')
ylabel('Right Hemisphere')
title('Percent surface area by hemisphere')
ax = gca;
ax.FontSize = 24;
close gcf
scatter(LH_surf_prop, RH_surf_prop, 80, rgb_colors, 'filled')
%axis([0 0.18 0 0.18])
line = refline(1,0);
line.Color = 'black';
xlabel('Left Hemisphere')
```

```
ylabel('Right Hemisphere')
title('Percent surface area by hemisphere')
ax = gca;
ax.FontSize = 24;
print(gcf, '/Users/dianaperez/Desktop/Thesis/Figures/MSC_network_surfarea_groupavg.jpg',↙
'-dpng', '-r300')
load('/Users/dianaperez/Desktop/HCP_network_sizes.mat')
LH_vert_prop = size_of_net(:,2);
LH_surf_prop = size_of_net(:,4);
RH_vert_prop = size_of_net(:,6);
RH_surf_prop = size_of_net(:,8);
scatter(LH_surf_prop, RH_surf_prop, 80, rgb_colors, 'filled')
%axis([0 0.18 0 0.18])
line = refline(1,0);
line.Color = 'black';
xlabel('Left Hemisphere')
ylabel('Right Hemisphere')
title('Percent surface area by hemisphere')
ax = gca;
ax.FontSize = 24;
print(gcf, '/Users/dianaperez/Desktop/Thesis/Figures/HCP_network_surfarea_groupavg.jpg',↙
'-dpng', '-r300')
load('/Users/dianaperez/Desktop/Thesis/Variant_Properties/HCP384_new_split_networksxHem.↙
mat')
avg_numVars = mean(networksxHem.clustersLH(:,:));
avg_numVars_RH = mean(networksxHem.clustersRH(:,:));
scatter(avg_numVars, avg_numVars_RH, 80, rgb_colors, 'filled')
axis([0 2.5 0 2.5])
line = refline(1,0);
line.Color = 'black';
xlabel('Left Hemisphere')
ylabel('Right Hemisphere')
title('Average Number of Variants')
ax = gca;
ax.FontSize = 24;
print(gcf, '/Users/dianaperez/Desktop/Thesis/Figures/HCP_numVarsbyHem.jpg', '-dpng', '-↙
r300')
help pie
h = pie(avg_numVars, network_names);
patchHandle = findobj(h, 'Type', 'Patch');
set(patchHandle, {'FaceColor'}, mat2cell(rgb_colors, ones(size(rgb_colors,1),1),3))
lgd = legend(network_names);
h = pie(avg_numVars, network_names)
patchHandle = findobj(h, 'Type', 'Patch')
set(patchHandle, {'FaceColor'}, mat2cell(rgb_colors, ones(size(rgb_colors,1),1),3))
lgd = legend(network_names);
lgd.Layout.Tile = 'east';
lgd.LayoutTile = 'east';
lgd.Layout.Tile = 'east';
lgd.FontSize = 24;
print(gcf, '/Users/dianaperez/Desktop/Thesis/Figures/Legend.jpg', '-dpng', '-r300')
load('/Users/dianaperez/Desktop/network_sizes.mat')
LH_vert_prop = size_of_net(:,2);
LH_surf_prop = size_of_net(:,4);
RH_vert_prop = size_of_net(:,6);
RH_surf_prop = size_of_net(:,8);
scatter(LH_surf_prop, RH_surf_prop, 80, rgb_colors, 'filled')
axis([0 0.18 0 0.18])
line = refline(1,0);
line.Color = 'black';
```

```
xlabel('Left Hemisphere')
ylabel('Right Hemisphere')
ax = gca;
ax.FontSize = 24;
print(gcf, '/Users/dianaperez/Desktop/Thesis/Figures/network_surfarea_groupavg.jpg', '-↙
dpng', '-r300')
title('Percent surface area by hemisphere')
print(gcf, '/Users/dianaperez/Desktop/Thesis/Figures/network_surfarea_groupavg.jpg', '-↙
dpng', '-r300')
this.metadata = [];
this.label = [];
this.data = [];
this_LH = this;
this_RH = this;
this_LH = gifti_read↙
('/Users/dianaperez/Box/Dependencies/32k_ConteAtlas_v2_distribute/RSN-networks.L.↙
32k_fs_LR.label.gii', this);
this_RH = gifti_read↙
('/Users/dianaperez/Box/Dependencies/32k_ConteAtlas_v2_distribute/RSN-networks.R.↙
32k_fs_LR.label.gii', this);
unique(this_LH.data{1,1}.data)
unique(this_LH.data{1,2}.data)
unique(this_LH.data{1,3}.data)
unique(this_LH.data{1,4}.data)
unique(this_RH.data{1,1}.data)
cifti_w_nonbrain = [this_LH.data{1,1}.data; this_RH.data{1,1}.data];
template = ft_read_cifti_mod↙
('/Users/dianaperez/Box/Dependencies/Important_Files/120_templates.dtseries.nii');
cifti = cifti_w_nonbrain(template.brainstructure>0);
template.data = cifti;
ft_write_cifti_mod('/Users/dianaperez/Desktop/Yeo_nets.dtseries.nii', template)
for v = 1:length(this_RH.data{1,1}.data)
end
medial = find(this_RH.data{1,1}.data==35);
this_RH.data{1,1}.data(medial) = 0;
unique(this_RH.data{1,1}.data)
net1 = find(this_RH.data{1,1}.data==36);
this_RH.data{1,1}.data(net1) = 42;
this_RH.data{1,1}.data(net1) = 39;
unique(this_RH.data{1,1}.data)
net2 = find(this_RH.data{1,1}.data==37);
this_RH.data{1,1}.data(net2) = 40;
unique(this_RH.data{1,1}.data)
net3 = find(this_RH.data{1,1}.data==38);
this_RH.data{1,1}.data(net3) = 41;
unique(this_RH.data{1,1}.data)
net4 = find(this_RH.data{1,1}.data==39);
this_RH.data{1,1}.data(net4) = 42;
net5 = find(this_RH.data{1,1}.data==40);
this_RH.data{1,1}.data(net5) = 43;
unique(this_RH.data{1,1}.data)
net6 = find(this_RH.data{1,1}.data==41);
this_RH.data{1,1}.data(net6) = 44;
unique(this_RH.data{1,1}.data)
this_RH = gifti_read↙
('/Users/dianaperez/Box/Dependencies/32k_ConteAtlas_v2_distribute/RSN-networks.R.↙
32k_fs_LR.label.gii', this);
network_seg
atlas_dir = '/Users/dianaperez/Box/Dependencies/';
atlas = 'Seitzman300';
```

```
% load atlas that contains roi info (including which rois belong to each network)
atlas_params = atlas_parameters_GrattonLab(atlas,atlas_dir);
for n = 1:size(atlas_params.networks,1) % go through each network
rois = atlas_params.mods{1,n}; %extract the rois belonging to system n
num_rois = length(rois); % number of rois in system n
net_size(n) = num_rois;
end
sum(net_size)
this.metadata = [];
this_RH = gifti_read↙
('/Users/dianaperez/Box/Dependencies/32k_ConteAtlas_v2_distribute/RSN-networks.R.↙
32k_fs_LR.label.gii', this);
addpath '/Users/dianaperez/Documents/GitHub/General_Scripts/gifti-master/@gifti/private'
this_RH = gifti_read↙
('/Users/dianaperez/Box/Dependencies/32k_ConteAtlas_v2_distribute/RSN-networks.R.↙
32k_fs_LR.label.gii', this);
addpath '/Users/dianaperez/Documents/GitHub/General_Scripts/gifti-master/@gifti/private'
this_RH = gifti_read↙
('/Users/dianaperez/Box/Dependencies/32k_ConteAtlas_v2_distribute/RSN-networks.R.↙
32k_fs_LR.label.gii', this);
cd '/Users/dianaperez/Documents/GitHub/General_Scripts/gifti-master/@gifti/private'
this_RH = gifti_read↙
('/Users/dianaperez/Box/Dependencies/32k_ConteAtlas_v2_distribute/RSN-networks.R.↙
32k_fs_LR.label.gii', this);
this.data = [];
this_RH = gifti_read↙
('/Users/dianaperez/Box/Dependencies/32k_ConteAtlas_v2_distribute/RSN-networks.R.↙
32k_fs_LR.label.gii', this);
this_LH = gifti_read↙
('/Users/dianaperez/Box/Dependencies/32k_ConteAtlas_v2_distribute/RSN-networks.R.↙
32k_fs_LR.label.gii', this);
cifti_w_nonbrain = [this_LH.data{1,1}.data; this_RH.data{1,1}.data];
template = ft_read_cifti_mod↙
('/Users/dianaperez/Box/Dependencies/Important_Files/120_templates.dtseries.nii');
cifti = cifti_w_nonbrain(template.brainstructure>0);
unique(this_LH.data{1,1}.data)
medial = find(this_LH.data{1,1}.data==35);
this_LH.data{1,1}.data(medial) = 0;
net1 = find(this_LH.data{1,1}.data==36);
this_LH.data{1,1}.data(net1) = 1;
net2 = find(this_LH.data{1,1}.data==37);
this_LH.data{1,1}.data(net2) = 2;
unique(this_LH.data{1,1}.data)
net3 = find(this_LH.data{1,1}.data==38);
this_LH.data{1,1}.data(net3) = 3;
net4 = find(this_LH.data{1,1}.data==39);
net5 = find(this_LH.data{1,1}.data==40);
net6 = find(this_LH.data{1,1}.data==41);
net7 = find(this_LH.data{1,1}.data==42);
this_LH.data{1,1}.data(net4) = 4;
this_LH.data{1,1}.data(net5) = 5;
this_LH.data{1,1}.data(net6) = 6;
this_LH.data{1,1}.data(net7) = 7;
unique(this_LH.data{1,1}.data)
unique(this_RH.data{1,1}.data)
medial = find(this_RH.data{1,1}.data==35);
net1 = find(this_RH.data{1,1}.data==36);
net2 = find(this_RH.data{1,1}.data==37);
net3 = find(this_RH.data{1,1}.data==38);
net4 = find(this_RH.data{1,1}.data==39);
```

```
net5 = find(this_RH.data{1,1}.data==40);
net6 = find(this_RH.data{1,1}.data==41);
net7 = find(this_RH.data{1,1}.data==42);
this_RH.data{1,1}.data(net7) = 7;
this_RH.data{1,1}.data(net6) = 6;
this_RH.data{1,1}.data(net5) = 5;
this_RH.data{1,1}.data(net4) = 4;
this_RH.data{1,1}.data(net3) = 3;
this_RH.data{1,1}.data(net2) = 2;
this_RH.data{1,1}.data(net1) = 1;
this_RH.data{1,1}.data(medial) = 0;
cifti_w_nonbrain = [this_LH.data{1,1}.data; this_RH.data{1,1}.data];
cifti = cifti_w_nonbrain(template.brainstructure>0);
template.data = cifti;
ft_write_cifti_mod('/Users/dianaperez/Desktop/Yeo_nets.dtseries.nii', template);
cifti_w_nonbrain = [this_LH.data{1,1}.data; this_RH.data{1,1}.data];
template.data = cifti_w_nonbrain;
ft_write_cifti_mod('/Users/dianaperez/Desktop/Yeo_nets_64k.dtseries.nii', template);
this_LH = gifti_read↙
('/Users/dianaperez/Box/Dependencies/32k_ConteAtlas_v2_distribute/RSN-networks.L.↙
32k_fs_LR.label.gii', this);
unique(this_LH.data{1,1}.data)
medial = find(this_LH.data{1,1}.data==37);
this_LH.data{1,1}.data(medial) = 0;
net1 = find(this_LH.data{1,1}.data==38);
this_LH.data{1,1}.data(net1) = 1;
net2 = find(this_LH.data{1,1}.data==39);
this_LH.data{1,1}.data(net2) = 2;
net3 = find(this_LH.data{1,1}.data==40);
this_LH.data{1,1}.data(net3) = 3;
net4 = find(this_LH.data{1,1}.data==41);
net5 = find(this_LH.data{1,1}.data==42);
net6 = find(this_LH.data{1,1}.data==43);
net7 = find(this_LH.data{1,1}.data==44);
this_LH.data{1,1}.data(net4) = 4;
this_LH.data{1,1}.data(net5) = 5;
this_LH.data{1,1}.data(net6) = 6;
this_LH.data{1,1}.data(net7) = 7;
unique(this_LH.data{1,1}.data)
cifti_w_nonbrain = [this_LH.data{1,1}.data; this_RH.data{1,1}.data];
cifti = cifti_w_nonbrain(template.brainstructure>0);
template.data = cifti;
ft_write_cifti_mod('/Users/dianaperez/Desktop/Yeo_nets.dtseries.nii', template);
unique(this_LH.data{1,2}.data)
og_ids = unique(this_LH.data{1,2}.data);
new_ids = 1:1:length(og_ids);
new_ids = 0:1:length(og_ids);
new_ids = 0:1:length(og_ids)-1;
this_LH = gifti_read↙
('/Users/dianaperez/Box/Dependencies/32k_ConteAtlas_v2_distribute/RSN-networks.R.↙
32k_fs_LR.label.gii', this);
gifti_LH = this_LH.data{1,2}.data;
og_ids = unique(gifti_LH);
new_ids = 0:1:length(og_ids)-1;
for i = 1:length(og_ids)
verts = find(gifti_LH==og_ids(i));
gifti_LH(verts) = new_ids(i);
end
unique(gifti_LH)
this_RH = gifti_read↙
```

```
('/Users/dianaperez/Box/Dependencies/32k_ConteAtlas_v2_distribute/RSN-networks.R.↙
32k_fs_LR.label.gii', this);
gifti_RH = this_RH.data{1,2}.data;
og_ids = unique(gifti_RH);
new_ids = 0:1:length(og_ids)-1;
for i = 1:length(og_ids)
verts = find(gifti_RH==og_ids(i));
gifti_RH(verts) = new_ids(i);
end
unique(gifti_RH)
template = ft_read_cifti_mod↙
('/Users/dianaperez/Box/Dependencies/Important_Files/120_templates.dtseries.nii');
cifti_w_nonbrain = [gifti_LH; gifti_RH];
cifti = cifti_w_nonbrain(template.brainstructure>0);
template.data = cifti;
ft_write_cifti_mod('/Users/dianaperez/Desktop/Yeo_17nets.dtseries.nii', template);
this_LH = gifti_read↙
('/Users/dianaperez/Box/Dependencies/32k_ConteAtlas_v2_distribute/RSN-networks.L.↙
32k_fs_LR.label.gii', this);
gifti_LH = this_LH.data{1,2}.data;
og_ids = unique(gifti_LH);
new_ids = 0:1:length(og_ids)-1;
for i = 1:length(og_ids)
verts = find(gifti_LH==og_ids(i));
gifti_LH(verts) = new_ids(i);
end
this_RH = gifti_read↙
('/Users/dianaperez/Box/Dependencies/32k_ConteAtlas_v2_distribute/RSN-networks.R.↙
32k_fs_LR.label.gii', this);
gifti_RH = this_RH.data{1,2}.data;
og_ids = unique(gifti_RH);
new_ids = 0:1:length(og_ids)-1;
for i = 1:length(og_ids)
verts = find(gifti_RH==og_ids(i));
gifti_RH(verts) = new_ids(i);
end
template = ft_read_cifti_mod↙
('/Users/dianaperez/Box/Dependencies/Important_Files/120_templates.dtseries.nii');
cifti_w_nonbrain = [gifti_LH; gifti_RH];
cifti = cifti_w_nonbrain(template.brainstructure>0);
template.data = cifti;
ft_write_cifti_mod('/Users/dianaperez/Desktop/Yeo_17nets.dtseries.nii', template);
this_LH = gifti_read↙
('/Users/dianaperez/Box/Dependencies/32k_ConteAtlas_v2_distribute/RSN-networks.L.↙
32k_fs_LR.label.gii', this);
gifti_LH = this_LH.data{1,2}.data;
og_ids = unique(gifti_LH);
new_ids = 0:1:length(og_ids)-1;
for i = 1:length(og_ids)
verts = find(gifti_LH==og_ids(i));
numverts(i,1) = length(verts);
gifti_LH(verts) = new_ids(i);
end
this_RH = gifti_read↙
('/Users/dianaperez/Box/Dependencies/32k_ConteAtlas_v2_distribute/RSN-networks.R.↙
32k_fs_LR.label.gii', this);
gifti_RH = this_RH.data{1,2}.data;
og_ids = unique(gifti_RH);
new_ids = 0:1:length(og_ids)-1;
for i = 1:length(og_ids)
```

```
verts = find(gifti_RH==og_ids(i));
numverts(i,2) = length(verts);
gifti_RH(verts) = new_ids(i);
end
clear
load('/Users/dianaperez/Desktop/Thesis/Variant_Properties/HCP384_new_split_networksxHem.↙
mat')
for net = 1:16
se_lh(net) = std(networksxHem.clustersLH(:,net))/sqrt(384);
se_rh(net) = std(networksxHem.clustersRH(:,net))/sqrt(384);
end
network_names = {'DMN'  'Vis'   'FP' 'Reward' 'DAN' 'Unassigned' 'Lang' 'Sal'   'CO'↙
'SMd'   'SMl'   'Aud'   'Tpole' 'MTL'   'PMN'   'PON'};
rgb_colors = [1 0 0; %DMN
0 0 .6; %Vis
1 1 0; %FP
.67 .67 .67; %Unassigned
0 .8 0; %DAN
.67 .67 .67; %Unassigned2
0 .6 .6;%VAN
0 0 0; % Sal
.3 0 .6; %CON
.2 1 1; %SMd
1 .5 0; % SMl
.6 .2 1; %Aud
.2 1 .2; %Tpole
0 .2 .4; %MTL
0 0 1; %PMN
.8 .8 .6]; %PON
lh_numvars = mean(networksxHem.clustersLH);
rh_numvars = mean(networksxHem.clustersRH);
errorbar(lh_numvars, rh_numvars, se_rh, se_rh, se_lh, se_lh, 'o')
hold on
scatter(lh_numvars, rh_numvars, 80, rgb_colors, 'filled')
axis([0 2.5 0 2,5])
axis([0 2.5 0 2.5])
line = refline(1,0);
line.Color = 'black';
xlabel('Left Hemisphere')
ylabel('Right Hemisphere')
title('Average number of variants')
ax = gca;
ax.FontSize = 24;
print(gcf, '/Users/dianaperez/Desktop/Thesis/Figures/HCP_numvars_scatter.jpg', '-dpng',↙
'-r300')
%-- 11/19/21, 3:36 PM --%
load(goodSubs384.mat)
load('goodSubs384.mat')
cd '/Users/dianaperez/Documents/GitHub/Lateralization_Variants'
load('goodSubs384.mat')
load↙
('/Users/dianaperez/Desktop/Thesis/Variant_Properties/HCP384_new_split_variants_info_wSur↙
fArea.mat')
numVars = variants_info.both_hems{1,1};
numVars1 = variants_info.both_hems{:,1};
handedness = goodSubs3841;
numVars = numVars1;
clear numVars1
clear goodSubs3841
corr(goodSubs384, handedness)
```

```
corrcoef(handedness, numVars)
[r, p] = corrcoef(handedness, numVars)
avgVarSize = variants_info.both_hems{:,2};
[r, p] = corrcoef(handedness, avgVarSize)
avgVarSize = variants_info.both_hems{:,3};
[r, p] = corrcoef(handedness, avgVarSize)
numborder = variants_info.both_hems{:,4};
[r, p] = corrcoef(handedness, numborder)
numectopic = variants_info.both_hems{:,5};
[r, p] = corrcoef(handedness, numectopic)
numVars = variants_info.left_hem.group_avg{:,1};
[r, p] = corrcoef(handedness, numVars)
numVerts = variants_info.left_hem.group_avg{:,2};
[r, p] = corrcoef(handedness, numVerts)
x = variants_info.left_hem.group_avg{:,3};
[r, p] = corrcoef(handedness, x)
x = variants_info.left_hem.group_avg{:,4};
[r, p] = corrcoef(handedness, x)
x = variants_info.left_hem.group_avg{:,5};
[r, p] = corrcoef(handedness, x)
x = variants_info.left_hem.group_avg{:,7};
[r, p] = corrcoef(handedness, x)
x = variants_info.right_hem.group_avg{:,7};
[r, p] = corrcoef(handedness, x)
x = variants_info.right_hem.group_avg{:,5};
[r, p] = corrcoef(handedness, x)
x = variants_info.right_hem.group_avg{:,4};
[r, p] = corrcoef(handedness, x)
x = variants_info.right_hem.group_avg{:,3};
[r, p] = corrcoef(handedness, x)
x = variants_info.right_hem.group_avg{:,2};
[r, p] = corrcoef(handedness, x)
x = variants_info.right_hem.group_avg{:,1};
[r, p] = corrcoef(handedness, x)
allSubs = table2cell(readtable('/Users/dianaperez/Desktop/Thesis/HCP_lang_measures.↙
xlsx'));
for x = 1:size(allSubs,1)
sub = cell2mat(allSubs(x,1));
if ismember(sub, goodSubs_col)
goodSubs_all(count,:) = allSubs(x,:);
count = count + 1;
end
end
for x = 1:size(allSubs,1)
sub = cell2mat(allSubs(x,1));
if ismember(sub, goodSubs384)
goodSubs_all(count,:) = allSubs(x,:);
count = count + 1;
end
end
count = 1;
for x = 1:size(allSubs,1)
sub = cell2mat(allSubs(x,1));
if ismember(sub, goodSubs384)
goodSubs_all(count,:) = allSubs(x,:);
count = count + 1;
end
end
HCP_384_goodsubs = goodSubs384;
find(goodSubs_all(:,1)==HCP_384_goodsubs(1,1))
```

```
find(goodSubs_all(:,1)=HCP_384_goodsubs(1,1))
find(goodSubs_all(:,1)==HCP_384_goodsubs(1,1))
HCP_384_goodsubs(:,3) = variants_info.left_hem.group_avg{:,1}
HCP_384_goodsubs(:,4) = variants_info.left_hem.group_avg{:,2};
HCP_384_goodsubs(:,5) = variants_info.left_hem.group_avg{:,3};
HCP_384_goodsubs(:,6) = variants_info.left_hem.group_avg{:,4};
HCP_384_goodsubs(:,7) = variants_info.left_hem.group_avg{:,5};
HCP_384_goodsubs(:,8) = variants_info.left_hem.group_avg{:,6};
HCP_384_goodsubs(:,9) = variants_info.left_hem.group_avg{:,7};
HCP_384_goodsubs(:,10) = variants_info.left_hem.group_avg{:,9};
HCP_384_goodsubs(:,10) = variants_info.left_hem.group_avg{:,8};
HCP_384_goodsubs(:,11) = variants_info.right_hem.group_avg{:,1}
HCP_384_goodsubs(:,12) = variants_info.right_hem.group_avg{:,2};
HCP_384_goodsubs(:,13) = variants_info.right_hem.group_avg{:,3};
HCP_384_goodsubs(:,14) = variants_info.right_hem.group_avg{:,4};
HCP_384_goodsubs(:,15) = variants_info.right_hem.group_avg{:,5};
HCP_384_goodsubs(:,16) = variants_info.right_hem.group_avg{:,6};
HCP_384_goodsubs(:,17) = variants_info.right_hem.group_avg{:,7};
HCP_384_goodsubs(:,18) = variants_info.right_hem.group_avg{:,8};
HCP_384_goodsubs(:,19) = variants_info.both_hems{:,1};
HCP_384_goodsubs(:,19) = variants_info.both_hems{:,2};
HCP_384_goodsubs(:,19) = variants_info.both_hems{:,1};
HCP_384_goodsubs(:,20) = variants_info.both_hems{:,2};
HCP_384_goodsubs(:,21) = variants_info.both_hems{:,3};
HCP_384_goodsubs(:,22) = variants_info.both_hems{:,4};
HCP_384_goodsubs(:,23) = variants_info.both_hems{:,5};
test = HCP_384_goodsubs;
[B, I] = sort(test(:,1), 'ascending')
[B, I] = sort(test(:,1), 'ascend')
[B, I] = sort(test(:,1), 'ascend');
HCP_sorted = test(I);
HCP_sorted = test(I,:);
HCP_sorted{:,24} = goodSubs_all{:,2};
HCP_sorted{:,24} = goodSubs_all1;
HCP_sorted{:,24} = goodSubs_all1{:,:};
HCP_sorted{:,24} = cell2mat(goodSubs_all{:,2});
testing = cell2mat(goodSubs_all)
HCP_sorted{:,24} = testing(:,2);
HCP_sorted(:,24) = testing(:,2);
HCP_sorted(:,25) = testing(:,3);
HCP_sorted(:,26) = testing(:,4);
HCP_sorted(:,27) = testing(:,5);
HCP_sorted(:,28) = testing(:,6);
HCP_sorted(:,29) = testing(:,7);
[r, p] = corrcoef(HCP_sorted(:,3), HCP_sorted(:,29))
find(isnan(HCP_sorted))
[r, p] = corrcoef(HCP_sorted(:,3), HCP_sorted(:,29), 'rows', 'complete')
[r, p] = corrcoef(HCP_sorted(:,3), HCP_sorted(:,28), 'rows', 'complete')
[r, p] = corrcoef(HCP_sorted(:,3), HCP_sorted(:,27), 'rows', 'complete')
[r, p] = corrcoef(HCP_sorted(:,3), HCP_sorted(:,26), 'rows', 'complete')
[r, p] = corrcoef(HCP_sorted(:,3), HCP_sorted(:,25), 'rows', 'complete')
[r, p] = corrcoef(HCP_sorted(:,3), HCP_sorted(:,24), 'rows', 'complete')
[r, p] = corrcoef(HCP_sorted(:,4), HCP_sorted(:,24), 'rows', 'complete')
[r, p] = corrcoef(HCP_sorted(:,4), HCP_sorted(:,25), 'rows', 'complete')
[r, p] = corrcoef(HCP_sorted(:,4), HCP_sorted(:,26), 'rows', 'complete')
[r, p] = corrcoef(HCP_sorted(:,4), HCP_sorted(:,27), 'rows', 'complete')
[r, p] = corrcoef(HCP_sorted(:,4), HCP_sorted(:,28), 'rows', 'complete')
[r, p] = corrcoef(HCP_sorted(:,4), HCP_sorted(:,29), 'rows', 'complete')
[r, p] = corrcoef(HCP_sorted(:,5), HCP_sorted(:,29), 'rows', 'complete')
[r, p] = corrcoef(HCP_sorted(:,5), HCP_sorted(:,28), 'rows', 'complete')
```

```
[r, p] = corrcoef(HCP_sorted(:,5), HCP_sorted(:,29), 'rows', 'complete')
[r, p] = corrcoef(HCP_sorted(:,6), HCP_sorted(:,29), 'rows', 'complete')
[r, p] = corrcoef(HCP_sorted(:,6), HCP_sorted(:,28), 'rows', 'complete')
[r, p] = corrcoef(HCP_sorted(:,6), HCP_sorted(:,27), 'rows', 'complete')
[r, p] = corrcoef(HCP_sorted(:,6), HCP_sorted(:,26), 'rows', 'complete')
[r, p] = corrcoef(HCP_sorted(:,6), HCP_sorted(:,25), 'rows', 'complete')
[r, p] = corrcoef(HCP_sorted(:,6), HCP_sorted(:,24), 'rows', 'complete')
[r, p] = corrcoef(HCP_sorted(:,7), HCP_sorted(:,24), 'rows', 'complete')
[r, p] = corrcoef(HCP_sorted(:,7), HCP_sorted(:,25), 'rows', 'complete')
[r, p] = corrcoef(HCP_sorted(:,7), HCP_sorted(:,26), 'rows', 'complete')
[r, p] = corrcoef(HCP_sorted(:,7), HCP_sorted(:,27), 'rows', 'complete')
[r, p] = corrcoef(HCP_sorted(:,7), HCP_sorted(:,28), 'rows', 'complete')
[r, p] = corrcoef(HCP_sorted(:,7), HCP_sorted(:,29), 'rows', 'complete')
[r, p] = corrcoef(HCP_sorted(:,8), HCP_sorted(:,29), 'rows', 'complete')
[r, p] = corrcoef(HCP_sorted(:,8), HCP_sorted(:,28), 'rows', 'complete')
[r, p] = corrcoef(HCP_sorted(:,8), HCP_sorted(:,26), 'rows', 'complete')
[r, p] = corrcoef(HCP_sorted(:,8), HCP_sorted(:,25), 'rows', 'complete')
[r, p] = corrcoef(HCP_sorted(:,8), HCP_sorted(:,24), 'rows', 'complete')
[r, p] = corrcoef(HCP_sorted(:,9), HCP_sorted(:,24), 'rows', 'complete')
[r, p] = corrcoef(HCP_sorted(:,9), HCP_sorted(:,25), 'rows', 'complete')
[r, p] = corrcoef(HCP_sorted(:,9), HCP_sorted(:,26), 'rows', 'complete')
[r, p] = corrcoef(HCP_sorted(:,9), HCP_sorted(:,27), 'rows', 'complete')
[r, p] = corrcoef(HCP_sorted(:,9), HCP_sorted(:,28), 'rows', 'complete')
[r, p] = corrcoef(HCP_sorted(:,9), HCP_sorted(:,29), 'rows', 'complete')
[r, p] = corrcoef(HCP_sorted(:,10), HCP_sorted(:,29), 'rows', 'complete')
[r, p] = corrcoef(HCP_sorted(:,10), HCP_sorted(:,28), 'rows', 'complete')
[r, p] = corrcoef(HCP_sorted(:,10), HCP_sorted(:,27), 'rows', 'complete')
[r, p] = corrcoef(HCP_sorted(:,10), HCP_sorted(:,26), 'rows', 'complete')
[r, p] = corrcoef(HCP_sorted(:,10), HCP_sorted(:,25), 'rows', 'complete')
[r, p] = corrcoef(HCP_sorted(:,10), HCP_sorted(:,24), 'rows', 'complete')
[r, p] = corrcoef(HCP_sorted(:,11), HCP_sorted(:,24), 'rows', 'complete')
[r, p] = corrcoef(HCP_sorted(:,12), HCP_sorted(:,24), 'rows', 'complete')
[r, p] = corrcoef(HCP_sorted(:,13), HCP_sorted(:,24), 'rows', 'complete')
[r, p] = corrcoef(HCP_sorted(:,14), HCP_sorted(:,24), 'rows', 'complete')
[r, p] = corrcoef(HCP_sorted(:,15), HCP_sorted(:,24), 'rows', 'complete')
[r, p] = corrcoef(HCP_sorted(:,16), HCP_sorted(:,24), 'rows', 'complete')
[r, p] = corrcoef(HCP_sorted(:,17), HCP_sorted(:,24), 'rows', 'complete')
[r, p] = corrcoef(HCP_sorted(:,18), HCP_sorted(:,24), 'rows', 'complete')
[r, p] = corrcoef(HCP_sorted(:,19), HCP_sorted(:,24), 'rows', 'complete')
[r, p] = corrcoef(HCP_sorted(:,20), HCP_sorted(:,24), 'rows', 'complete')
[r, p] = corrcoef(HCP_sorted(:,21), HCP_sorted(:,24), 'rows', 'complete')
[r, p] = corrcoef(HCP_sorted(:,22), HCP_sorted(:,24), 'rows', 'complete')
[r, p] = corrcoef(HCP_sorted(:,23), HCP_sorted(:,24), 'rows', 'complete')
[r, p] = corrcoef(HCP_sorted(:,23), HCP_sorted(:,25), 'rows', 'complete')
[r, p] = corrcoef(HCP_sorted(:,22), HCP_sorted(:,25), 'rows', 'complete')
[r, p] = corrcoef(HCP_sorted(:,21), HCP_sorted(:,25), 'rows', 'complete')
[r, p] = corrcoef(HCP_sorted(:,20), HCP_sorted(:,25), 'rows', 'complete')
[r, p] = corrcoef(HCP_sorted(:,19), HCP_sorted(:,25), 'rows', 'complete')
[r, p] = corrcoef(HCP_sorted(:,18), HCP_sorted(:,25), 'rows', 'complete')
[r, p] = corrcoef(HCP_sorted(:,17), HCP_sorted(:,25), 'rows', 'complete')
[r, p] = corrcoef(HCP_sorted(:,16), HCP_sorted(:,25), 'rows', 'complete')
[r, p] = corrcoef(HCP_sorted(:,15), HCP_sorted(:,25), 'rows', 'complete')
[r, p] = corrcoef(HCP_sorted(:,14), HCP_sorted(:,25), 'rows', 'complete')
[r, p] = corrcoef(HCP_sorted(:,13), HCP_sorted(:,25), 'rows', 'complete')
[r, p] = corrcoef(HCP_sorted(:,12), HCP_sorted(:,25), 'rows', 'complete')
[r, p] = corrcoef(HCP_sorted(:,11), HCP_sorted(:,25), 'rows', 'complete')
[r, p] = corrcoef(HCP_sorted(:,11), HCP_sorted(:,28), 'rows', 'complete')
[r, p] = corrcoef(HCP_sorted(:,1), HCP_sorted(:,28), 'rows', 'complete')
[r, p] = corrcoef(HCP_sorted(:,12), HCP_sorted(:,28), 'rows', 'complete')
[r, p] = corrcoef(HCP_sorted(:,13), HCP_sorted(:,28), 'rows', 'complete')
```

```
[r, p] = corrcoef(HCP_sorted(:,14), HCP_sorted(:,28), 'rows', 'complete')
[r, p] = corrcoef(HCP_sorted(:,15), HCP_sorted(:,28), 'rows', 'complete')
[r, p] = corrcoef(HCP_sorted(:,16), HCP_sorted(:,28), 'rows', 'complete')
[r, p] = corrcoef(HCP_sorted(:,17), HCP_sorted(:,28), 'rows', 'complete')
[r, p] = corrcoef(HCP_sorted(:,18), HCP_sorted(:,28), 'rows', 'complete')
[r, p] = corrcoef(HCP_sorted(:,19), HCP_sorted(:,28), 'rows', 'complete')
[r, p] = corrcoef(HCP_sorted(:,20), HCP_sorted(:,28), 'rows', 'complete')
[r, p] = corrcoef(HCP_sorted(:,21), HCP_sorted(:,28), 'rows', 'complete')
[r, p] = corrcoef(HCP_sorted(:,22), HCP_sorted(:,28), 'rows', 'complete')
[r, p] = corrcoef(HCP_sorted(:,23), HCP_sorted(:,28), 'rows', 'complete')
plot(HCP_sorted(:,23), HCP_sorted(:,variant_info.both_hems{:,1}))
plot(HCP_sorted(:,23), HCP_sorted(:,variants_info.both_hems{:,1}))
plot(HCP_sorted(:,2), HCP_sorted(:,variants_info.both_hems{:,1}))
numVars1 = variants_info.both_hems{:,1};
plot(HCP_sorted(:,2), variants_info.both_hems{:,1}))
plot(HCP_sorted(:,2), variants_info.both_hems{:,1})
scatter(HCP_sorted(:,2), variants_info.both_hems{:,1})
diff_numvars = HCP_sorted(:,3) - HCP_sorted(:,11);
[r, p]=corrcoef(diff_numvars, HCP_sorted(:,24));
[r, p]=corrcoef(diff_numvars, HCP_sorted(:,25));
[r, p]=corrcoef(diff_numvars, HCP_sorted(:,26))
[r, p]=corrcoef(diff_numvars, HCP_sorted(:,26), 'rows', 'complete')
[r, p]=corrcoef(diff_numvars, HCP_sorted(:,27), 'rows', 'complete')
[r, p]=corrcoef(diff_numvars, HCP_sorted(:,28), 'rows', 'complete')
[r, p]=corrcoef(diff_numvars, HCP_sorted(:,29), 'rows', 'complete')
[r, p]=corrcoef(diff_numvars, HCP_sorted(:,24), 'rows', 'complete')
[r, p]=corrcoef(diff_numvars, HCP_sorted(:,25), 'rows', 'complete')
diff_numvars = HCP_sorted(:,4) - HCP_sorted(:,12);
[r, p]=corrcoef(diff_numvars, HCP_sorted(:,24), 'rows', 'complete')
[r, p]=corrcoef(diff_numvars, HCP_sorted(:,25), 'rows', 'complete')
[r, p]=corrcoef(diff_numvars, HCP_sorted(:,26), 'rows', 'complete')
[r, p]=corrcoef(diff_numvars, HCP_sorted(:,27), 'rows', 'complete')
[r, p]=corrcoef(diff_numvars, HCP_sorted(:,28), 'rows', 'complete')
[r, p]=corrcoef(diff_numvars, HCP_sorted(:,29), 'rows', 'complete')
cd /Volumes/Research_HD
cd Lifespan_taskfMRI/
clear all
cd ~/Desktop
DownloadPsychtoolbox
DownloadPsychtoolbox.m
cd ~/Downloads
DownloadPsychtoolbox
%-- 11/22/21, 1:10 PM --%
DownloadPsychtoolbox
yes
cd /Volumes/Research_HD
%-- 11/22/21, 8:44 PM --%
cd /Volumes/Research_HD
%-- 11/24/21, 9:34 AM --%
cd /Volumes/RESEARCH_HD/
mixed_short
test
0
mixed
test
0
sca
help HideCursor
ShowCursor()
mixed
```

```
test
0
sca
mixed
test
0
mixed
test
0
sca
%-- 11/24/21, 10:41 AM --%
mixed
test
0
%-- 11/24/21, 10:42 AM --%
mixed
test
0
%-- 11/24/21, 11:03 AM --%
mixed
test
0
mixed
test
0
mixed
test
0
mixed
test
0
mixed
test
1
%-- 11/24/21, 12:13 PM --%
group_avg = ft_read_cifti_mod('/Users/dianaperez/Desktop/Yeo_7nets.dtseries.nii');
left_hem = group_avg.data(1:29696);
right_hem = group_avg.data(29697:end);
surf_areas = ft_read_cifti_mod('/Users/dianaperez/Desktop/Thesis/surf_areas_verts.↙
dtseries.nii');
lh_surf = surf_areas.data(1:29696);
rh_surf = surf_areas.data(29697:end);
num_nets = unique(group_avg.data);
net_size = [];
for net = 1:num_nets
lh_verts = find(left_hem==num_nets(net));
rh_verts = find(right_hem==num_nets(net));
net_size(net,1) = length(lh_verts);
net_size(net,2) = length(rh_verts);
net_size(net,3) = sum(lh_surf(lh_verts));
net_size(net,4) = sum(rh_surf(rh_verts));
end
net_size_across_hems
%-- 11/24/21, 2:20 PM --%
mixed
test
1
y
sca
mixed
```

```
test
1
y
sca
%-- 11/29/21, 3:13 PM --%
net_size_across_hems
rgb_colors = [1 0 0;    %DMN
0 0 .6; %Vis
1 1 0; %FP
0 .8 0; %DAN
0 .6 .6;%VAN
0 0 0;%SAl
.3 0 .6;%CON
.2 1 1;%SMd
1 .5 0;%SMl
.6 .2 1;%Aud
.2 1 .2;%Tpole
0 .2 .4;%MTL
0 0 1; %PMN
.8 .8 .6]; %PON
scatter(net_size(:,4), net_size(:,8), 80, rgb_colors, 'filled')
rgb_colors = [1 0 0; %DMN
0 0 .6; %Vis
1 1 0; %FP
.67 .67 .67; %Unassigned
0 .8 0; %DAN
.67 .67 .67; %Unassigned2
0 .6 .6;%VAN
0 0 0; % Sal
.3 0 .6; %CON
.2 1 1; %SMd
1 .5 0; % SMl
.6 .2 1; %Aud
.2 1 .2; %Tpole
0 .2 .4; %MTL
0 0 1; %PMN
.8 .8 .6]; %PON
this.data = [];
this.label = [];
this.metadata = [];
uiopen('/Users/dianaperez/Box/Dependencies/32k_ConteAtlas_v2_distribute/RSN-networks.L.↙
32k_fs_LR.label.gii',1)
Yeo_l = gifti_read('/Users/dianaperez/Box/Dependencies/32k_ConteAtlas_v2_distribute/RSN-↙
networks.L.32k_fs_LR.label.gii', this);
rgb_medialwall = Yeo_l.label.rgba(38,1:3);
rgb_yeo_7nets = [rgb_medialwall; Yeo_l.label.rgba(39:45,1:3)];
rgb_yeo_17nets = [rgb_medialwall; Yeo_l.label.rgba(46:62,1:3)];
rgb_yeo_17nets
scatter(net_size(:,4), net_size(:,8), 80, rgb_yeo_17nets, 'filled')
axis([0 .14 0 .14])
line = refline(1,0);
line.Color = 'black';
xlabel('Left Hemisphere')
ylabel('Right Hemisphere')
ax = gca;
ax.FontSize = 24;
print(gcf, '/Users/dianaperez/Desktop/Thesis/Figures/Yeo17nets_groupavg_surfarea_scatter.↙
jpg', '-dpng', '-r300')
group_avg = ft_read_cifti_mod('/Users/dianaperez/Desktop/Yeo_7nets.dtseries.nii');
left_hem = group_avg.data(1:29696);
```

```
right_hem = group_avg.data(29697:end);
%load surf area file
surf_areas = ft_read_cifti_mod('/Users/dianaperez/Desktop/Thesis/surf_areas_verts.↙
dtseries.nii');
lh_surf = surf_areas.data(1:29696);
rh_surf = surf_areas.data(29697:end);
num_nets = unique(group_avg.data);
net_size = [];
for net = 1:length(num_nets)
lh_verts = find(left_hem==num_nets(net));
rh_verts = find(right_hem==num_nets(net));
net_size(net,1) = length(lh_verts);
net_size(net,2) = length(lh_verts)/length(left_hem);
net_size(net,3) = sum(lh_surf(lh_verts));
net_size(net,4) = sum(lh_surf(lh_verts))/sum(lh_surf);
net_size(net,5) = length(rh_verts);
net_size(net,6) = length(rh_verts)/length(right_hem);
net_size(net,7) = sum(rh_surf(rh_verts));
net_size(net,8) = sum(rh_surf(rh_verts))/sum(rh_surf);
end
scatter(net_size(:,4), net_size(:,8), 80, rgb_yeo_7nets, 'filled')
close gcf
scatter(net_size(:,4), net_size(:,8), 80, rgb_yeo_7nets, 'filled')
axis([0 .25 0 .25])
line = refline(1,0);
line.Color = 'black';
xlabel('Left Hemisphere')
ylabel('Right Hemisphere')
ax = gca;
ax.FontSize = 24;
print(gcf, '/Users/dianaperez/Desktop/Thesis/Figures/Yeo7nets_groupavg_surfarea_scatter.↙
jpg', '-dpng', '-r300')
network_names_yeo17 = {'Medial Wall', 'Visual Central', 'DMN A', 'DAN B', 'Control A',↙
'Limbic A', 'DAN A', 'Control B', 'DMN B', 'DMN C', 'Visual Peripheral', 'Somatomotor B',↙
'Limbic B', 'Control C', 'Somatomotor A', 'Salience', 'VAN', 'DMN D (Aud)'};
network_names_yeo7 = {'Medial Wall', 'DAN', 'FPN', 'DMN', 'Visual', 'Limbic',↙
'Somatomotor', 'VAN'};
pie(net_size(:,4), network_names_yeo7);
close gcf
pie(net_size(:,4), network_names_yeo7);
patchHandle = findobj(h, 'Type', 'Patch');
set(patchHandle, {'FaceColor'}, mat2cell(rgb_yeo_7nets, ones(size(rgb_colors,1),1),3))
set(patchHandle, {'FaceColor'}, mat2cell(rgb_yeo_7nets, ones(size(rgb_yeo_7nets,1),1),3))
h = pie(net_size(:,4), network_names_yeo7);
patchHandle = findobj(h, 'Type', 'Patch');
set(patchHandle, {'FaceColor'}, mat2cell(rgb_yeo_7nets, ones(size(rgb_yeo_7nets,1),1),3))
lgd = legend(network_names_yeo7);
lgd.Layout.Tile = 'east';
lgd.FontSize = 24;
net_size_across_hems
h = pie(net_size(:,4), network_names_yeo17);
close gcf
h = pie(net_size(:,4), network_names_yeo17);
patchHandle = findobj(h, 'Type', 'Patch');
set(patchHandle, {'FaceColor'}, mat2cell(rgb_yeo_17nets, ones(size(rgb_yeo_17nets,1),1),↙
3))
lgd = legend(network_names_yeo17);
lgd.FontSize = 24;
network_names_yeo7
clear all
```

```
rgb_colors = [1 0 0;    %DMN
0 0 .6; %Vis
1 1 0; %FP
0 .8 0; %DAN
0 .6 .6;%VAN
.3 0 .6;%CON
.2 1 1;%SMd
.6 .2 1;%Aud
.8 .8 .6]; %PON
output_dir = '/Users/dianaperez/Desktop/Thesis/Spatial_Location/';
load([output_dir 'operc_nets_lefthemcluster_righthem.mat']);
leftclust_righthem = LH_cluster;
load([output_dir 'operc_nets_lefthemcluster_lefthem.mat']);
leftclust_lefthem = LH_cluster;
clear LH_cluster
%-- 12/2/21, 12:18 PM --%
rgb_colors = [1 0 0;
1 1 0;
0 .8 0;
0 .6 .6;
0 0 0;
.3 0 .6;
1 .5 0;
.8 .8 .6;];
output_dir = '/Users/dianaperez/Desktop/Thesis/Spatial_Location/';
load([output_dir 'operc_nets_righthemcluster_righthem.mat']);
rightclust_righthem = RH_cluster;
load([output_dir 'operc_nets_righthemcluster_lefthem.mat']);
rightclust_lefthem = RH_cluster;
clear RH_cluster
network_names = {'DMN'  'FP' 'DAN' 'Lang'   'Sal'   'CO'    'SMl' 'PON'};
for net = 1:16
nets_left(net) = length(find(rightclust_lefthem.vars(:,3)==net));
end
nets_left(12:15) = [];
nets_left(10) = [];
nets_left(6) = [];
nets_left(4) = [];
nets_left(2) = [];
means = [];
network_names = {'DMN'  'FP' 'DAN' 'Lang'   'Sal'   'CO'    'SMl' 'PON'};
for net = 1:16
numVars = find(rightclust_lefthem.vars(:,3)==net);
nets_left(net) = mean(numVars);
end
nets_left(12:15) = [];
nets_left(10) = [];
nets_left(6) = [];
nets_left(4) = [];
nets_left(2) = [];
for net = 1:16
numVars = find(rightclust_righthem.vars(:,3)==net);
nets_right(net) = mean(numVars);
end
nets_right(12:15) = [];
nets_right(10) = [];
nets_right(6) = [];
nets_right(4) = [];
nets_right(2) = [];
numVars = find(rightclust_lefthem.vars(:,3)==net);
```

```
numVars = find(rightclust_lefthem.vars(:,3)==1);
%-- 12/17/21, 3:27 PM --%
cd /Volumes
cd RESEARCH_HD/
cd HCP_Variants/
cd new_split_vars/
var_freq_size_net
clear surf_areas
var_freq_size_net
subs{1}
var_freq_size_net
clear all
var_freq_size_net
subs{1,1}
var_freq_size_net
subs{1,1}{1}
subs{1,1}{1,1}
subs{1,1}(1)
var_freq_size_net
[data_location num2str(subs{g,1}(n)) bordEctop_str]
var_freq_size_net
numel(subs)
length(subs{1}
length(subs{1})
var_freq_size_net
clear all
load↙
('/Users/dianaperez/Desktop/lateralization_code/testing_output/HCP384_new_split_networksx↙
Hem.mat')
load↙
('/Users/dianaperez/Desktop/lateralization_code/testing_output/HCP384_new_split_variants_↙
info.mat')
var_freq_size_net
load↙
('/Users/dianaperez/Desktop/lateralization_code/testing_output/HCP752_new_split_RH_matche↙
d_variants_info.mat')
clear all
load↙
('/Users/dianaperez/Desktop/lateralization_code/testing_output/HCP752_new_split_RH_matche↙
d_variants_info.mat')
%-- 12/20/21, 5:39 PM --%
var_freq_size_net
floor(1:9/2)
%-- 12/21/21, 11:15 AM --%
in_str = 'HCP384';
out_str = append(in_str, '_LHandvsRHand_');
mixed
test
1
mixed
test
1
cd /Volumes/RESEARCH_HD/Lifespan_taskfMRI/
mixed
test
1
y
sca
mixed
test
```

```
1
y
sca
mixed
%-- 12/21/21, 11:32 AM --%
mixed
test
1
y
%-- 12/21/21, 12:58 PM --%
perms_var_freq_size
var_freq_size_net
perms_var_freq_size
var_freq_size_net
perms_var_freq_size
length(allSubs_info.variants_info.left_hem.group_avg)
height(allSubs_info.variants_info.left_hem.group_avg)
var_freq_size_net
perms_var_freq_size
var_freq_size_net
perms_var_freq_size
length(find(perm_diffs<true_diff))/numperms
length(find(perm_diffs>true_diff))/numperms
perms_var_freq_size
mixed
test
1
y
%-- 12/21/21, 2:28 PM --%
perms_var_freq_size
plotSpread
perms_var_freq_size
handles = plotSpread(perm_diffs, 'categoryMarkers', {'o', '.'}, 'categoryLabels',↙
{'Permuted Difference','True Difference'}, 'categoryColors', {'k','r'}, 'xValues', [1])
handles = plotSpread(perm_diffs, 'categoryMarkers', 'o', 'categoryLabels', 'Permuted↙
Difference', 'categoryColors', 'k', 'xValues', [1])
handles = plotSpread(perm_diffs, 'categoryMarkers', 'o', 'categoryLabels', 'Permuted↙
Difference', 'categoryColors', 'k')
perms_var_freq_size
handles = plotSpread(perm_diffs, 'categoryMarkers', 'o', 'categoryLabels', 'Permuted↙
Difference', 'categoryColors', 'k')
perms_var_freq_size
axis([0.5, 1.5, min(perm_diffs)-5, max(perm_diffs)+5])
ax.FontSize = 20;
ax.FontSize = 12;
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.3, 0.7]); %first and second↙
control position on screen, third controls width, and fourth controls height
print(gcf,outfile,'-dpng','-r300');
perms_var_freq_size
LHand_info.variants_info.both_hems{:,4}
var_freq_size_net
subs{g,1}
subs{g,1}(n)
subs{g,1}{n}
var_freq_size_net
perms_var_freq_size
[p_fdr p_masked] = FDR(p_vals, .025);
perms_var_freq_size
permute_net_assignment
save([output_dir 'network_perms_numVars.mat'], 'output_mat');
```

```
rgb_colors = [1 0 0; %DMN
0 0 .6; %Vis
1 1 0; %FP
.67 .67 .67; %Unassigned
0 .8 0; %DAN
.67 .67 .67; %Unassigned2
0 .6 .6;%VAN
0 0 0; % Sal
.3 0 .6; %CON
.2 1 1; %SMd
1 .5 0; % SMl
.6 .2 1; %Aud
.2 1 .2; %Tpole
0 .2 .4; %MTL
0 0 1; %PMN
.8 .8 .6]; %PON
good_nets = [output_mat(:,1:3) output_mat(:,5) output_mat(:,7:end)];
rgb_for_plot = {};
for n = 1:numel(network_names)
rgb_for_plot{n} = rgb_colors(n,:);
end
ind = zeros(1001,1);
ind(1,1) = 1;
net_inds = [ind ind ind ind ind ind ind ind ind ind ind ind ind ind];
handles = plotSpread(good_nets, 'categoryMarkers', {'x', '.'}, 'categoryLabels',↙
{'Permuted Differences','True Difference'}, 'distributionColors', rgb_for_plot',↙
'categoryIdx', net_inds, 'xNames', network_names)
ax = gca;
ax.FontSize = 24;
scatter([1:14],good_nets(1,:), 'MarkerEdgeColor', 'k', 'MarkerFaceColor', 'k',↙
'SizeData', 50)
scatter(6,good_nets(1,6), 'MarkerEdgeColor', 'w', 'MarkerFaceColor', 'w', 'SizeData', 50)
ylabel('Difference in Number of Variants')
xlabel('Assigned Network')
axis([0, 15, -0.4, .7])
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.9, 0.7]);
%-- 12/21/21, 9:54 PM --%
permute_net_assignment
`rgb_colors = [1 0 0; %DMN
0 0 .6; %Vis
1 1 0; %FP
.67 .67 .67; %Unassigned
0 .8 0; %DAN
.67 .67 .67; %Unassigned2
0 .6 .6;%VAN
0 0 0; % Sal
.3 0 .6; %CON
.2 1 1; %SMd
1 .5 0; % SMl
.6 .2 1; %Aud
.2 1 .2; %Tpole
0 .2 .4; %MTL
0 0 1; %PMN
.8 .8 .6]; %PON
good_nets = [output_mat(:,1:3) output_mat(:,5) output_mat(:,7:end)];
rgb_good_nets = [rgb_color(:,1:3); rgb_color(:,5); rgb_color(:,7:end)];
rgb_for_plot = {};
for n = 1:14
rgb_for_plot{n} = rgb_good_nets(n,:);
end
```

```
rgb_colors = [1 0 0; %DMN
0 0 .6; %Vis
1 1 0; %FP
.67 .67 .67; %Unassigned
0 .8 0; %DAN
.67 .67 .67; %Unassigned2
0 .6 .6;%VAN
0 0 0; % Sal
.3 0 .6; %CON
.2 1 1; %SMd
1 .5 0; % SMl
.6 .2 1; %Aud
.2 1 .2; %Tpole
0 .2 .4; %MTL
0 0 1; %PMN
.8 .8 .6]; %PON
good_nets = [output_mat(:,1:3) output_mat(:,5) output_mat(:,7:end)];
rgb_good_nets = [rgb_color(:,1:3); rgb_color(:,5); rgb_color(:,7:end)];
rgb_for_plot = {};
for n = 1:14
rgb_for_plot{n} = rgb_good_nets(n,:);
end
rgb_good_nets = [rgb_colors(:,1:3); rgb_colors(:,5); rgb_colors(:,7:end)];
rgb_good_nets = [rgb_colors(1:3,:); rgb_colors(5,:); rgb_colors(7:end,:)];
rgb_for_plot = {};
for n = 1:14
rgb_for_plot{n} = rgb_good_nets(n,:);
end
ind = zeros(1001,1);
ind(1,1) = 1;
net_inds = [ind ind ind ind ind ind ind ind ind ind ind ind ind ind];
handles = plotSpread(good_nets, 'categoryMarkers', {'x', '.'}, 'categoryLabels',↙
{'Permuted Differences','True Difference'}, 'distributionColors', rgb_for_plot',↙
'categoryIdx', net_inds, 'xNames', network_names)
ax = gca;
ax.FontSize = 24;
scatter([1:14],good_nets(1,:), 'MarkerEdgeColor', 'k', 'MarkerFaceColor', 'k',↙
'SizeData', 50)
scatter(6,good_nets(1,6), 'MarkerEdgeColor', 'w', 'MarkerFaceColor', 'w', 'SizeData', 50)
ylabel('Difference in Number of Variants')
xlabel('Assigned Network')
axis([0, 15, -0.4, .7])
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.9, 0.7]);
print(gcf,[output_dir out_str '_PermutationTesting_networkAssignment.jpg'],'-dpng','-↙
r300');
allSubs_info = load([data_location in_str '_variants_info.mat']);
width(allSubs_info.variants_info.left_hem.group_avg)
help stdev
var_freq_size_net
min([leftHem; rightHem])-std([leftHem; rightHem])
max([leftHem; rightHem])+std([leftHem; rightHem])
axis([-0.2, 0.5, min([leftHem; rightHem])-std([leftHem; rightHem]), max([leftHem;↙
rightHem])+std([leftHem; rightHem])])
var_freq_size_net
leftHem = variants_info.left_hem.group_avg{:,1};
rightHem = variants_info.right_hem.group_avg{:,1};
[h,mu,sigma,q,notch] = al_goodplot(leftHem,0.1,.2,[ 0    0.4470    0.7410],'left');
[h,mu,sigma,q,notch] = al_goodplot(rightHem,0.11,.2,[0.8500    0.3250↙
0.0980],'right');
xticks([0.105])
```

```
xticklabels('Number of Variant Regions')
axis([-0.2, 0.5, min([leftHem; rightHem])-std([leftHem; rightHem]), max([leftHem;↙
rightHem])+std([leftHem; rightHem])])
ax = gca;
ax.FontSize = 24;
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.3, 0.9]); %first and second↙
control position on screen, third controls width, and fourth controls height
m = findobj(gca, 'Type', 'Scatter');
hleg1 = legend(m(1:2), 'Right Hemisphere', 'Left Hemisphere', 'Location',↙
'SouthOutside');
print(gcf, [output_dir out_str '_numVars.jpg'], '-dpng', '-r300')
out_str = {'HCP384'};
print(gcf, [output_dir out_str '_numVars.jpg'], '-dpng', '-r300')
[output_dir out_str '_numVars.jpg']
[output_dir cell2mat(out_str) '_numVars.jpg']
print(gcf, [output_dir cell2mat(out_str) '_numVars.jpg'], '-dpng', '-r300')
close gcf
leftHem = variants_info.left_hem.group_avg{:,2};
rightHem = variants_info.right_hem.group_avg{:,2};
[h,mu,sigma,q,notch] = al_goodplot(leftHem,0.1,.2,[ 0    0.4470    0.7410],'left');
[h,mu,sigma,q,notch] = al_goodplot(rightHem,0.11,.2,[0.8500    0.3250↙
0.0980],'right');
xticks([0.105])
xticklabels('Number of Variant Vertices')
axis([-0.2, 0.5, min([leftHem; rightHem])-std([leftHem; rightHem]), max([leftHem;↙
rightHem])+std([leftHem; rightHem])])
ax = gca;
ax.FontSize = 24;
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.3, 0.9]); %first and second↙
control position on screen, third controls width, and fourth controls height
m = findobj(gca, 'Type', 'Scatter');
hleg1 = legend(m(1:2), 'Right Hemisphere', 'Left Hemisphere', 'Location',↙
'SouthOutside');
print(gcf, [output_dir cell2mat(out_str) '_numVarVerts.jpg'], '-dpng', '-r300')
axis([-0.2, 0.5, min([leftHem; rightHem])-std([leftHem; rightHem]), max([leftHem;↙
rightHem])+std([leftHem; rightHem])])
close gcf
leftHem = variants_info.left_hem.group_avg{:,3};
rightHem = variants_info.right_hem.group_avg{:,3};
[h,mu,sigma,q,notch] = al_goodplot(leftHem,0.1,.2,[ 0    0.4470    0.7410],'left');
[h,mu,sigma,q,notch] = al_goodplot(rightHem,0.11,.2,[0.8500    0.3250↙
0.0980],'right');
xticks([0.105])
xticklabels('Average Variant Size')
ylabel('Number of vertices')
axis([-0.2, 0.5, min([leftHem; rightHem])-std([leftHem; rightHem]), max([leftHem;↙
rightHem])+std([leftHem; rightHem])])
ax = gca;
ax.FontSize = 24;
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.3, 0.9]); %first and second↙
control position on screen, third controls width, and fourth controls height
m = findobj(gca, 'Type', 'Scatter');
hleg1 = legend(m(1:2), 'Right Hemisphere', 'Left Hemisphere', 'Location',↙
'SouthOutside');
print(gcf, [output_dir cell2mat(out_str) '_avgSizeVerts.jpg'], '-dpng', '-r300')
close gcf
leftHem = variants_info.left_hem.group_avg{:,4};
rightHem = variants_info.right_hem.group_avg{:,4};
[h,mu,sigma,q,notch] = al_goodplot(leftHem,0.1,.2,[ 0    0.4470    0.7410],'left');
[h,mu,sigma,q,notch] = al_goodplot(rightHem,0.11,.2,[0.8500    0.3250↙
```

```
0.0980],'right');
xticks([0.105])
xticklabels('Average Variant Size')
ylabel('Surface area (mm^2)')
axis([-0.2, 0.5, min([leftHem; rightHem])-std([leftHem; rightHem]), max([leftHem;↙
rightHem])+std([leftHem; rightHem])])
ax = gca;
ax.FontSize = 24;
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.3, 0.9]); %first and second↙
control position on screen, third controls width, and fourth controls height
m = findobj(gca, 'Type', 'Scatter');
hleg1 = legend(m(1:2), 'Right Hemisphere', 'Left Hemisphere', 'Location',↙
'SouthOutside');
print(gcf, [output_dir cell2mat(out_str) '_avgSizeSurfArea.jpg'], '-dpng', '-r300')
close gcf
network_names = {'DMN'  'Vis'   'FP'    'DAN'   'VAN'   'Sal'   'CO'    'SMd'   'SMl'↙
'Aud'   'Tpole' 'MTL'   'PMN'   'PON'};
good_nets_LH = [networksxHem.clustersLH(:,1:3) networksxHem.clustersLH(:,5) networksxHem.↙
clustersLH(:,7:end)];
good_nets_RH = [networksxHem.clustersRH(:,1:3) networksxHem.clustersRH(:,5) networksxHem.↙
clustersRH(:,7:end)];
good_nets_LH = mean(good_nets_LH);
good_nets_RH = mean(good_nets_RH);
means = [good_nets_LH good_nets_RH];
means = [good_nets_LH' good_nets_RH'];
bar(1:14, means)
legend('Left Hem', 'Right Hem')
xticks(1:14)
xticklabels(network_names)
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.5, 0.7, 0.5, 0.7]);
ylabel('Average Number of Variants Assigned to Network');
xlabel('Network');
title_str('Variants Assigned to Each Network Across Hemispheres');
print(gcf,[output_dir cell2mat(out_str) '_netAssignment.jpg','-dpng','-r300');
title('Variants Assigned to Each Network Across Hemispheres');
print(gcf,[output_dir cell2mat(out_str) '_netAssignment.jpg','-dpng','-r300');
print(gcf,[output_dir cell2mat(out_str) '_netAssignment.jpg','-dpng','-r300']);
ax = gca;
ax.FontSize = 24;
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.9, 0.7]);
print(gcf,[output_dir cell2mat(out_str) '_netAssignment.jpg','-dpng'],'-r300');
[output_dir cell2mat(out_str) '_netAssignment.jpg']
print(gcf,[output_dir cell2mat(out_str) '_netAssignment.jpg'],'-dpng','-r300');
close gcf
%-- 12/28/21, 9:24 AM --%
help exists
help stdev
ft_read_cifti_mod↙
('/Volumes/RESEARCH_HD/HCP_Variants/new_split_vars/reassigned/100206_border1ectopic2.↙
dtseries.nii')
cifti = ans;
template = cifti;
clear cifti
template.data = [];
template.data = zeroes(size(ans.data));
template.data = zeros(size(ans.data));
ft_write_cifti_mod('/Users/dianaperez/Desktop/lateralization_code/needed_files/template.↙
dtseries.nii', template)
open ft_write_cifti_mod
ft_write_cifti_mod('/Users/dianaperez/Desktop/lateralization_code/needed_files/template.↙
```

```
dtseries.nii', template)
filename = '/Users/dianaperez/Desktop/lateralization_code/needed_files/template.dtseries.↙
nii';
source = template;
ft_write_cifti_mod
ft_write_cifti_mod(filename, template)
permute_spatial_dist_handedness
help exists
permute_spatial_dist_handedness
permute_spatial_distribution
length(subs{g})
save(left_cifti_loc, 'true_left_hems')
save(right_cifti_loc, 'true_right_hems')
permute_spatial_distribution
%-- 1/6/22, 8:39 AM --%
make_spCorr_Map(1,'/Volumes/Back_Up/Lifespan/dconns/sub-LS02_allsess_tmasked.dconn.nii',↙
'/Volumes/Back_Up/Lifespan/dconns/sub-LS02_allsess_tmasked_sptlCorr.dtseries.↙
nii','/Volumes/Back_Up/Lifespan/dconns/120_allsubs_corr.dconn.nii')
make_spCorr_Map
make_spCorr_Map(1,'/Volumes/Back_Up/Lifespan/dconns/sub-LS02_allsess_tmasked.dconn.nii',↙
'/Volumes/Back_Up/Lifespan/dconns/sub-LS02_allsess_tmasked_sptlCorr.dtseries.↙
nii','/Volumes/Back_Up/Lifespan/dconns/120_allsubs_corr.dconn.nii')
dconn_dat
make_spCorr_Map(1,'/Volumes/Back_Up/Lifespan/dconns/sub-LS02_allsess_tmasked.dconn.nii',↙
'/Volumes/Back_Up/Lifespan/dconns/sub-LS02_allsess_tmasked_sptlCorr.dtseries.↙
nii','/Volumes/Back_Up/Lifespan/d_conns/120_allsubs_corr.dconn.nii')
make_spCorr_Map
make_spCorr_Map(1,'/Volumes/Back_Up/Lifespan/dconns/sub-LS02_allsess_tmasked.dconn.nii',↙
'/Volumes/Back_Up/Lifespan/dconns/sub-LS02_allsess_tmasked_sptlCorr.dtseries.↙
nii','/Volumes/Back_Up/Lifespan/d_conns/120_allsubs_corr.dconn.nii')
dconn_dat
make_spCorr_Map(1,'/Volumes/Back_Up/Lifespan/dconns/sub-LS02_allsess_tmasked.dconn.nii',↙
'/Volumes/Back_Up/Lifespan/d_conns/sub-LS02_allsess_tmasked_sptlCorr.dtseries.↙
nii','/Volumes/Back_Up/Lifespan/d_conns/120_allsubs_corr.dconn.nii')
make_spCorr_Map(1,'/Volumes/Back_Up/Lifespan/d_conns/sub-LS02_allsess_tmasked.dconn.nii',↙
'/Volumes/Back_Up/Lifespan/d_conns/sub-LS02_allsess_tmasked_sptlCorr.dtseries.↙
nii','/Volumes/Back_Up/Lifespan/d_conns/120_allsubs_corr.dconn.nii')
dconn_dat
%-- 1/6/22, 1:43 PM --%
similarity_analysis
hline_new([3,8,13,15,16,21,26,28,33,34,39,44]+0.5,'k',2);
vline_new([3,8,13,15,16,21,26,28,33,34,39,44]+0.5,'k',2);
hline_new([3,8,13,18,19,24,29,31,36,37,42,47]+0.5,'k',2);
close gcf
figure('Position',[1 1 1000 800]);
imagesc(simmat,[0 1]); colormap('jet');
hline_new([3,8,13,18,19,24,29,31,36,37,42,47]+0.5,'k',2);
vline_new([3,8,13,18,19,24,29,31,36,37,42,47]+0.5,'k',2);
close gcf
figure('Position',[1 1 1000 800]);
imagesc(simmat,[0 1]); colormap('jet');
hline_new([8,18,19,29,31,36,37,42,47]+0.5,'k',2);
vline_new([8,18,19,29,31,36,37,42,47]+0.5,'k',2);
set(gca,'XTick',[4,13.5,19,24.5,30.5,34,37,40,45], 'YTick',↙
[4,13.5,19,24.5,30.5,34,37,40,45], 'XTickLabel',...
{'LS02', 'LS03', 'LS04', 'LS05', 'LS07', 'LS08', 'LS10', 'LS11', 'LS14'}, 'YTickLabel',↙
{'LS02', 'LS03', 'LS04', 'LS05', 'LS07', 'LS08', 'LS10', 'LS11', 'LS14'});
axis square;
colorbar;
close gcf
```

```
figure('Position',[1 1 1000 800]);
imagesc(simmat,[0 1]); colormap('jet');
hline_new([8,18,19,29,31,36,37,42]+0.5,'k',2);
vline_new([8,18,19,29,31,36,37,42]+0.5,'k',2);
set(gca,'XTick',[4,13.5,19,24.5,30.5,34,37,40,45], 'YTick',↙
[4,13.5,19,24.5,30.5,34,37,40,45], 'XTickLabel',...
{'LS02', 'LS03', 'LS04', 'LS05', 'LS07', 'LS08', 'LS10', 'LS11', 'LS14'}, 'YTickLabel',↙
{'LS02', 'LS03', 'LS04', 'LS05', 'LS07', 'LS08', 'LS10', 'LS11', 'LS14'});
axis square;
colorbar;
title('Correlation Matrix Similarity');
saveas(gcf,[outDir 'SimilarityMat_rest.tiff'],'tiff');
maskmat = ones(atlas_params.num_rois);
maskmat = logical(triu(maskmat,1));
count = 1;
for s = 1:9
tmp = mean_corrmat(s,:,:,:);
corrlin(count,:) = tmp(maskmat);
count = count+1;
end
simmat = corr(corrlin');
figure('Position',[1 1 1000 800]);
imagesc(simmat,[0 1]); colormap('jet');
close gcf
maskmat = ones(atlas_params.num_rois);
maskmat = logical(triu(maskmat,1));
count = 1;
for s = 1:9
tmp = mean_corrmat(s,:,:,:);
corrlin(count,:) = tmp(maskmat);
count = count+1;
end
simmat = corr(corrlin');
figure('Position',[1 1 1000 800]);
imagesc(simmat,[0 1]); colormap('jet');
maskmat = ones(atlas_params.num_rois);
maskmat = logical(triu(maskmat,1));
count = 1;
tmp = mean_corrmat(1,:,:,:);
corrlin(count,:) = tmp(maskmat);
count = count+1;
tmp = mean_corrmat(2,:,:,:);
corrlin(count,:) = tmp(maskmat);
count = count+1;
tmp = mean_corrmat(3,:,:,:);
clear corrlin
count = 1;
tmp = mean_corrmat(1,:,:,:);
corrlin(count,:) = tmp(maskmat);
count = count+1;
clear corrlin
for s = 1:9
tmp = mean_corrmat(s,:,:,:);
corrlin(count,:) = tmp(maskmat);
count = count+1;
end
clear corrlin
maskmat = ones(atlas_params.num_rois);
maskmat = logical(triu(maskmat,1));
count = 1;
```

```
for s = 1:9
tmp = mean_corrmat(s,:,:,:);
corrlin(count,:) = tmp(maskmat);
count = count+1;
end
simmat = corr(corrlin');
figure('Position',[1 1 1000 800]);
imagesc(simmat,[0 1]); colormap('jet');
hline_new([1:8]+0.5,'k',2);
vline_new([1:8]+0.5,'k',2);
set(gca,'XTick',[1:9], 'YTick', [1:9], 'XTickLabel',...
{'LS02', 'LS03', 'LS04', 'LS05', 'LS07', 'LS08', 'LS10', 'LS11', 'LS14'}, 'YTickLabel',↙
{'LS02', 'LS03', 'LS04', 'LS05', 'LS07', 'LS08', 'LS10', 'LS11', 'LS14'});
axis square;
colorbar;
title('Correlation Matrix Similarity');
saveas(gcf,[outDir 'SimilarityMat_averaged.tiff'],'tiff');
clar corrmat
clear corrmat
clear corrlin
count = 1;
subs = {'LS02', 'LS03', 'LS05'};
ses_pre = [3,5,5];
ses_post = [5,5,5];
count = 1;
for sub = 1:numel(subs)
for ses = 1:ses_pre(sub)
data = load(sprintf('%s/sub-%s/sub-%s_sess-%d_task-rest_corrmat_Seitzman300.mat',↙
datadir, subs{sub}, subs{sub}, ses));
corrmat(count,:,:,:) =  data.corrmat;
sub_corrmat(ses,:,:,:) = data.corrmat;
count = count + 1;
end
if ses > 1
mean_corrmat(sub,:,:,:) = squeeze(mean(sub_corrmat));
clear sub_corrmat
else
mean_corrmat(sub,:,:,:)= squeeze(sub_corrmat);
end
end
%-- 1/8/22, 2:16 PM --%
datadir = '/Volumes/Back_Up/Lifespan/corrmats/';
outDir = '/Volumes/Back_Up/Lifespan/CNS_analyses/';
atlas_dir = '/Users/dianaperez/Box/Dependencies/';
addpath(genpath('/Users/dianaperez/Documents/GitHub/GrattonLab-General-Repo/FCPROCESS'));
addpath(genpath('/Users/dianaperez/Box/Scripts'))
addpath(genpath('/Users/dianaperez/Box/Dependencies/cifti-matlab-master'))
addpath(genpath('/Users/dianaperez/Box/Quest_Backup/Darmouth_MIND2'))
atlas_params = atlas_parameters_GrattonLab('Seitzman300',atlas_dir);
subs = {'LS02', 'LS03', 'LS05'};
ses_pre = [3,5,5];
ses_post = [5,5,5];
count = 1;
for sub = 1:numel(subs)
for ses = 1:ses_pre(sub)
data = load(sprintf('%s/sub-%s/sub-%s_sess-%d_task-rest_corrmat_Seitzman300.mat',↙
datadir, subs{sub}, subs{sub}, ses));
corrmat(count,:,:,:) =  data.corrmat;
sub_corrmat(ses,:,:,:) = data.corrmat;
count = count + 1;
```

```
end
if ses > 1
mean_corrmat(sub,:,:,:) = squeeze(mean(sub_corrmat));
clear sub_corrmat
else
mean_corrmat(sub,:,:,:)= squeeze(sub_corrmat);
end
end
maskmat = ones(atlas_params.num_rois);
maskmat = logical(triu(maskmat,1));
count = 1;
for sub = 1:numel(subs)
for ses = 1:ses_pre(sub)
data = load(sprintf('%s/sub-%s/sub-%s_sess-%d_task-rest_corrmat_Seitzman300.mat',↙
datadir, subs{sub}, subs{sub}, ses));
corrmat(count,:,:,:) =  data.corrmat;
sub_corrmat(ses,:,:,:) = data.corrmat;
count = count + 1;
end
if ses > 1
mean_pre(sub,:,:,:) = squeeze(mean(sub_corrmat));
clear sub_corrmat
else
mean_pre(sub,:,:,:)= squeeze(sub_corrmat);
end
end
count = 1;
for sub = 1:numel(subs)
for ses = ses_pre(sub)+1:ses_pre(sub)+ses_post(sub)
data = load(sprintf('%s/sub-%s/sub-%s_sess-%d_task-rest_corrmat_Seitzman300.mat',↙
datadir, subs{sub}, subs{sub}, ses));
corrmat(count,:,:,:) =  data.corrmat;
sub_corrmat(ses,:,:,:) = data.corrmat;
count = count + 1;
end
if ses > 1
mean_post(sub,:,:,:) = squeeze(mean(sub_corrmat));
clear sub_corrmat
else
mean_post(sub,:,:,:)= squeeze(sub_corrmat);
end
end
maskmat = ones(atlas_params.num_rois);
maskmat = logical(triu(maskmat,1));
count = 1;
for sub = 1:numel(subs)
tmp = mean_pre(count,:,:,:);
corrlin_pre(count,:) = single(tmp(maskmat));
tmp = mean_post(count,:,:,:);
corrlin_post(count,:) = single(tmp(maskmat));
count = count + 1;
end
simmat = corr(corrlin_pre', corrlin_post');
figure('Position',[1 1 1000 800]);
imagesc(simmat,[0 1]); colormap('jet');
hline_new([1:2]+0.5,'k',2);
vline_new([1:2]+0.5,'k',2);
set(gca,'XTick',[1:3], 'YTick', [1:3], 'XTickLabel',...
{'LS02', 'LS03', 'LS05'}, 'YTickLabel', {'LS02', 'LS03', 'LS05'});
axis square;
```

```
colorbar;
title('Correlation Matrix Similarity - 1 year apart');
saveas(gcf,[outDir 'SimilarityMat_longitudinal.tiff'],'tiff');
reliability_analysis
addpath '/Users/dianaperez/Documents/GitHub/Lifespan-Analysis'
reliability_analysis
plot(times,corr)
plot(times,corr(1,:),'LineWidth',3)
plot(times(1:20),corr(1,:),'LineWidth',3)
length(times(1:20)
length(times(1:20))
length(corr(1,:))
plot(times(1:20),corr(1,1:20),'Color',[1, 0.5, 0],'LineWidth', 3)
hold on
plot(times(1:20),corr(2,1:20),'Color',[0, 0, 1],'LineWidth', 3)
plot(times(1:20),corr(3,1:20),'Color',[0, 1, 0],'LineWidth', 3)
close gcf
times =[5:5:100];
figure;
plot(times(1:20),corr(1,1:20),'Color',[1, 0, 0],'LineWidth', 3) %LS02
ylim([0 1]);
hold on
plot(times(1:20),corr(2,1:20),'Color',[0, 1, 0],'LineWidth', 3) %LS03
hold on
plot(times(1:20),corr(3,1:20),'Color',[0, 0, 1],'LineWidth', 3)%LS05
hold on
plot(times(1:20),corr(4,1:20),'Color',[0, 1, 1],'LineWidth', 3)%LS08
hold on
plot(times(1:20),corr(4,1:20),'Color',[1, 0, 1],'LineWidth', 3)%LS11
hold on
plot(times(1:20),corr(4,1:20),'Color',[0, 0, 0],'LineWidth', 3)%LS14
close gcf
times =[5:5:100];
figure;
plot(times(1:20),corr(1,1:20),'Color',[1, 0, 0],'LineWidth', 3) %LS02
hold on
plot(times(1:20),corr(2,1:20),'Color',[0, 1, 0],'LineWidth', 3) %LS03
hold on
plot(times(1:20),corr(3,1:20),'Color',[0, 0, 1],'LineWidth', 3)%LS05
hold on
plot(times(1:3),corr(4,1:3),'Color',[0, 1, 1],'LineWidth', 3)%LS08
hold on
plot(times(1:20),corr(4,1:20),'Color',[1, 0, 1],'LineWidth', 3)%LS11
hold on
close gcf
times =[5:5:100];
figure;
plot(times(1:20),corr(1,1:20),'Color',[1, 0, 0],'LineWidth', 3) %LS02
hold on
plot(times(1:20),corr(2,1:20),'Color',[0, 1, 0],'LineWidth', 3) %LS03
hold on
plot(times(1:20),corr(3,1:20),'Color',[0, 0, 1],'LineWidth', 3)%LS05
hold on
plot(times(1:3),corr(4,1:3),'Color',[0, 1, 1],'LineWidth', 3)%LS08
hold on
plot(times(1:20),corr(5,1:20),'Color',[1, 0, 1],'LineWidth', 3)%LS11
hold on
plot(times(1:20),corr(6,1:20),'Color',[0, 0, 0],'LineWidth', 3)%LS14
ylabel('Pearson Correlation (r)');
xlabel('Time (Minutes)');
```

```
m = findobj(gca,'Type','line');
hleg1 = legend(m(1:6), 'LS14', 'LS11', 'LS08', 'LS05', 'LS03', 'LS02', 'Location',↙
'SouthEast');
reliability_analysis
print(gcf, '/Volumes/Back_Up/Lifespan/CNS_analyses/reliability_figure.jpg', '-dpng', '-↙
r300');
reliability_analysis
corrs_for_mean = [corr(1:3,1:20; corr(5:6,1:20)];
mean = mean(corrs_for_mean);
corrs_for_mean = [corr(1:3,1:20); corr(5:6,1:20)];
mean = mean(corrs_for_mean);
times =[5:5:100];
figure;
plot(times(1:20),corr(1,1:20),'Color',[1, 0, 0],'LineWidth', 3) %LS02
hold on
plot(times(1:20),corr(2,1:20),'Color',[0, 1, 0],'LineWidth', 3) %LS03
hold on
plot(times(1:20),corr(3,1:20),'Color',[0, 0, 1],'LineWidth', 3)%LS05
hold on
plot(times(1:3),corr(4,1:3),'Color',[0, 1, 1],'LineWidth', 3)%LS08
hold on
plot(times(1:20),corr(5,1:20),'Color',[1, 0, 1],'LineWidth', 3)%LS11
hold on
plot(times(1:20),corr(6,1:20),'Color',[0, 0, 0],'LineWidth', 3)%LS14
hold on
plot(times(1:20),mean, ':', 'Color', [0.4940 0.1840 0.5560], 'LineWidth',3) %average
ylabel('Pearson Correlation (r)');
xlabel('Time (Minutes)');
m = findobj(gca,'Type','line');
hleg1 = legend(m(1:7), 'Average', 'LS14', 'LS11', 'LS08', 'LS05', 'LS03', 'LS02',↙
'Location', 'SouthEast');
hleg1.FontSize = 14;
ax = gca;
ax.FontSize = 17;
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.5, 0.7, 0.5, 0.7]);
print(gcf, '/Volumes/Back_Up/Lifespan/CNS_analyses/reliability_figure.jpg', '-dpng', '-↙
r300');
similarity_analysis
clear all
similarity_analysis
hline_new([3,13,24]+0.5,'k',1);
vline_new([3,13,24]+0.5,'k',1);
similarity_analysis
% longitudinal analysis
subs = {'LS02', 'LS03', 'LS05'};
sessions = [8,10,10];
clear corrmat
count = 1;
for sub = 1:numel(subs)
for ses = 1:sessions(sub)
data = load(sprintf('%s/sub-%s/sub-%s_sess-%d_task-rest_corrmat_Seitzman300.mat',↙
datadir, subs{sub}, subs{sub}, ses));
corrmat(count,:,:,:) =  data.corrmat;
sub_corrmat(ses,:,:,:) = data.corrmat;
count = count + 1;
end
end
figure('Position',[1 1 1000 800]);
imagesc(simmat,[0 1]); colormap('jet');
hline_new([8,18]+0.5,'k',2);
```

```
hline_new([3,13,23]+0.5,'k',.5);
vline_new([8,18]+0.5,'k',2);
vline_new([3,13,23]+0.5,'k',.5);
set(gca,'XTick',[4,13.5,23.5], 'YTick', [4,13.5,23.5], 'XTickLabel',...
{'LS02', 'LS03', 'LS05'}, 'YTickLabel', {'LS02', 'LS03', 'LS05'});
axis square;
colorbar;
title('Correlation Matrix Similarity');
similarity_analysis
clear corrlin
maskmat = ones(atlas_params.num_rois);
maskmat = logical(triu(maskmat,1));
count = 1;
for sub = 1:numel(subs)
for ses = 1:sessions(sub)
tmp = corrmat(count,:,:,:);
if fisher
corrlin(count,:) = single(FisherTransform(tmp(maskmat)));
else
corrlin(count,:) = single(tmp(maskmat));
end
count = count + 1;
end
end
simmat = corr(corrlin');
similarity_analysis
clear corrlin
similarity_analysis
%-- 1/12/22, 11:05 AM --%
ft_read_cifti_mod('/Volumes/RESEARCH_HD/Lifespan/CNS_analyses/sub-↙
LS02_vs_120_avg_corr_LR_cortex_corr.dtseries.nii')
spCorr = ans;
clear ans
template = ft_read_cifti_mod('/Volumes/fsmresfiles/PBS/Gratton_Lab/Lifespan/Pre-↙
COVID/BIDS/Nifti/derivatives/postFCproc_CIFTI/dconn_cifti_normalwall/spatialCorrMapLS03_v↙
s_120_allsubs_corr_cortex_smooth_2.55.dtseries.nii');
template.data = spCorr.data;
ft_write_cifti_mod('/Users/dianaperez/Desktop/sub-LS02_spCorrMap.dtseries.nii',↙
template);
spCorr = ft_read_cifti_mod('/Volumes/RESEARCH_HD/Lifespan/CNS_analyses/sub-↙
LS03_vs_120_avg_corr_LR_cortex_corr.dtseries.nii')
template.data = spCorr.data;
ft_write_cifti_mod('/Users/dianaperez/Desktop/sub-LS03_spCorrMap.dtseries.nii',↙
template);
spCorr = ft_read_cifti_mod('/Volumes/RESEARCH_HD/Lifespan/CNS_analyses/sub-↙
LS05_vs_120_avg_corr_LR_cortex_corr.dtseries.nii');
template.data = spCorr.data;
ft_write_cifti_mod('/Users/dianaperez/Desktop/sub-LS05_spCorrMap.dtseries.nii',↙
template);
pre = spCorr.data;
clear all
pre = ft_read_cifti_mod('/Volumes/fsmresfiles/PBS/Gratton_Lab/Lifespan/Pre-↙
COVID/BIDS/Nifti/derivatives/postFCproc_CIFTI/dconn_cifti_normalwall/sub-↙
LS02_vs_120_allsubs_corr_cortex_corr.dtseries.nii');
post = ft_read_cifti_mod('/Users/dianaperez/Desktop/sub-LS02_spCorrMap.dtseries.nii');
spCorr = corr(pre.data, post.data);
pre = ft_read_cifti_mod('/Volumes/fsmresfiles/PBS/Gratton_Lab/Lifespan/Pre-↙
COVID/BIDS/Nifti/derivatives/postFCproc_CIFTI/dconn_cifti_normalwall/sub-↙
LS03_vs_120_allsubs_sptlCorr_cortex_smooth_2.55.dtseries.nii');
post = ft_read_cifti_mod('/Users/dianaperez/Desktop/sub-LS03_spCorrMap.dtseries.nii');
```

```
spCorr = corr(pre.data, post.data);
pre = ft_read_cifti_mod('/Volumes/fsmresfiles/PBS/Gratton_Lab/Lifespan/Pre-↙
COVID/BIDS/Nifti/derivatives/postFCproc_CIFTI/dconn_cifti_normalwall/sub-↙
LS05_vs_120_allsubs_sptlCorr_cortex_smooth_2.55.dtseries.nii');
post = ft_read_cifti_mod('/Users/dianaperez/Desktop/sub-LS05_spCorrMap.dtseries.nii');
spCorr = corr(pre.data, post.data);
CreateVariantFiles_LS03specific
unique(cifti_rest.data)
CreateVariantFiles_LS03specific
clear all
EmReg_task
%-- 1/15/22, 4:26 PM --%
EmReg_task
sca
KbName('return')
KbName('enter')
[keyIsDown,secs, keyCode] = KbCheck
find(keyCode>0)
unique(keyCode)
[keyIsDown,secs, keyCode] = KbCheck
vleftKey = KbName('LeftArrow');
rightKey = KbName('RightArrow');
spaceBar = KbName('space');
%-- 1/24/22, 6:38 PM --%
help rand
permute_spatial_dist_handedness
rand_LH = all_data(:,ind(1:length(LH)));
rand_RH = all_data(:,ind(length(LH)+1:end));
corr(rand_LH, rand_RH)
ind = randperm(numSubs)
permute_spatial_dist_handedness
figure;
ind = zeros(length(perm_diffs),1);
ind(1,1) = 1;
handles = plotSpread(spCorrs, 'categoryMarkers', {'o', '.'}, 'categoryLabels', {'Permuted↙
Correlation', 'True Correlation'}, 'categoryColors', {'k', 'r'}, 'categoryIdx', [ind])
scatter(1,spCorrs(1,:), 'MarkerEdgeColor', 'red', 'MarkerFaceColor', 'red', 'SizeData',↙
50)
ax = gca;
ax.FontSize = 12;
axis([0.5, 1.5, min(spCorrs)-std(spCorrs), max(spCorrs)+std(spCorrs)])
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.3, 0.7]); %first and second↙
control position on screen, third controls width, and fourth controls height
print(gcf,[output_dir out_str '_permuted_spatialCorrs_' num2str(numperms)↙
'_permutations_figure.jpg'],'-dpng','-r300');
close gcf
help logical
network_names =↙
{'DMN','Vis','FP','Unassigned','DAN','Unassigned','VAN','Sal','CO','SMd','SMl','Aud','Tpo↙
le','MTL','PMN','PON'};
network_names{0}
overlapmap
unique(group_map)
unique(variant_map_mat)
overlapmap
num_vars = find(variant_map_mat>0);
num_vars_check = find(group_map>0);
clear num_var*
overlapmap
num_vars = find(variant_map_mat==net_id);
```

```
num_vars_check = find(group_map==1);
clear num_var*
net_size_across_hems
help exists
net_size_across_hems
axis([0 .5 0 .5])
axis([0 .2 0 .2])
axis([0 .18 0 .18])
ax.FontSize = 24;
legend(network_names)
close gcf
scatter(net_size(:,4), net_size(:,8), 80, rgb_colors, 'filled')
axis([0 .2 0 .2])
legend(network_names)
close gcf
scatter(net_size(:,4), net_size(:,8), 80, rgb_colors, 'filled')
axis([0 .2 0 .2])
line = refline(1,0);
line.Color = 'black';
xlabel('Left Hemisphere')
ylabel('Right Hemisphere')
ax = gca;
ax.FontSize = 24;
print(gcf, [out_dir out_str '_groupavg_nets_surfarea_scatter.jpg'], '-dpng', '-r300')
close gcf
net_size_across_hems
ax_max = max([x;y])+std([x;y]))
ax_max = max([x;y])+std([x;y])
x = net_size(:,4); y = net_size(:,8);
ax_max = max([x;y])+std([x;y])
axis([0 ax_max 0 ax_max])
ax_max = max([x;y])+(std([x;y]/2))
axis([0 ax_max 0 ax_max])
net_size_across_hems
EmReg_task
help inputdlg
save('/Volumes/RESEARCH_HD/LifespanProjectTasks/EmoReg/emotions_table.mat', 'myExp')
EmReg_task
sca
EmReg_task
sca
EmReg_task
sca
%-- 1/26/22, 12:58 PM --%
EmReg_task
sca
EmReg_task
sca
EmReg_task
sca
%-- 1/26/22, 1:03 PM --%
EmReg_task
sca
%-- 1/26/22, 1:06 PM --%
EmReg_task
%-- 1/26/22, 1:07 PM --%
EmReg_task
sca
%-- 1/26/22, 2:28 PM --%
EmReg_task
```

```
sca
PsychHID
clear all
PsychHID
elements=PsychHID('Elements',deviceNumber)
rc = PsychHID(‘KeyboardHelper’, commandCode)
rc = PsychHID('KeyboardHelper', commandCode)
rc = PsychHID('Devices'))
rc = PsychHID('Devices')
[navail] = PsychHID('KbQueueFlush')
PsychHID(‘KbQueueCreate’)
%-- 1/26/22, 2:40 PM --%
EmReg_task
sca
%-- 1/26/22, 2:57 PM --%
KbCheck
EmReg_task
sca
KbWait
KbCheck
EmReg_task
sca
EmReg_task
sca
%-- 1/26/22, 5:35 PM --%
KbWait
%-- 1/26/22, 5:36 PM --%
KbWait
%-- 1/26/22, 5:39 PM --%
KbWait
k;jsdjsla;c
EmReg_task
sca
EmReg_task
sca
KbName('space')
KbCheck
pause(.5);KbCheck
pause(.5);KbChec
pause(.5);KbCheck
[keyIsDown,secs, keyCode] = KbCheck;
clear all
PsychHID('Devices')
clear PsychHID
dev = PsychHID('Devices')
[secs, keyCode] = KbWait
WaitSecs(0.2);[secs, key] = KbWait
[a,b,c] = GetKeyboardIndices
KbName(‘UnifyKeyNames’)
KbName('UnifyKeyNames')
WaitSecs(0.2);[secs, key] = KbWait
jj jbnjnmnkkjh j
WaitSecs(0.2);[secs, key] = KbWait(3)
WaitSecs(0.2);[secs, key] = KbWait(9)
EmReg_task
sca
EmReg_task
sca
EmReg_task
sca
```

```
load([root_dir 'emotions_table.mat']);
emotions = myExp;
emotions{1,1}
EmReg_task
sca
emotions{1,2}
load('emotions_table.mat')
url_emoscale = '/scales/emotion_scale.png';
myExp{1:13,2} = url_emoscale;
myExp{1,2}
myExp{1,2} = url_emoscale
myExp1{1,2} = url_emoscale
clear myExp
clear myExp1
clear emotions
clear all
scale = imread(myExp{1,2});
emotions = table2cell(myExp)
scale = imread(emotions{1,2});
emotions{1,2}
scale = imread(string(emotions{1,2}));
scale = imread([root_dir string(emotions{1,2})]);
root_dir = '/Volumes/RESEARCH_HD/LifespanProjectTasks/EmoReg/'
scale = imread([root_dir string(emotions{1,2})]);
[root_dir string(emotions{1,2})];
string(emotions{1,2})
cellstr(emotions{1,2})
[root_dir cellstr(emotions{1,2})];
help nominal
[root_dir char(emotions{1,2})];
scale = imread([root_dir char(emotions{1,2})]);
EmReg_task
clear all
[a,b,c] = GetKeyboardIndices
clear PsychHID
[a,b,c] = GetKeyboardIndices
EmReg_task
sca
clear all
save('emotions_table.mat', 'myExp')
[root_dir myExp{1,2}]
root_dir = '/Volumes/RESEARCH_HD/LifespanProjectTasks/EmoReg/'
[root_dir myExp{1,2}]
EmReg_task
clear all
[a,b,c] = GetKeyboardIndices
EmReg_task
scale = Screen('MakeTexture', window, scale_img);
scale_img = imread([root_dir emotions_table{emo,2}]);
scale = Screen('MakeTexture', window, scale_img);
scale_img = imread([root_dir emotions_table{1,2}]);
EmReg_task
help CenterRectOnPointd
EmReg_task
output
EmReg_task
Screen('DrawText', 10, 'Enter a number, then press RETURN', 'center', 'center', [0,0,0],↙
[1,1,1])
window
EmReg_task
```

```
Screen('DrawText', 2, 'Enter a number, then press RETURN', 'center', 'center', [0,0,0],↙
[1,1,1])
Screen('DrawText', 2, 'Enter a number, then press RETURN', [], [], [0,0,0], [1,1,1])
GetEchoString
EmReg_task
Screen('DrawText', 2, 'Enter a number, then press RETURN', [], [], [0,0,0], [1,1,1])
EmReg_task
6
sca
EmReg_task
7
7
sca
cd /Users/dianaperez/Desktop
var_freq_size_net
cd '/Users/dianaperez/Documents/GitHub/PerezEtAl_HemAsymmetries'
var_freq_size_net
cell2mat(out_str{g})
cell2mat(out_str(g))
var_freq_size_net
perms_var_freq_size
permute_net_assignment
min_ax = min(good_nets(:,:))-(std(good_nets)/2);
min_ax = min(good_nets(:,:))-(std(good_nets(:,:))/2);
min(good_nets(:,:))
min_ax = min(min(good_nets(:,:)))-(min(std(good_nets)/2));
max_ax = max(max(good_nets(:,:)))+(min(std(good_nets)/2));
axis([0, 15, min_ax, max_ax])
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.9, 0.7]);
print(gcf,[output_dir out_str '_PermutationTesting_networkAssignment.jpg'],'-dpng','-↙
r300');
close gcf
permute_net_assignment
operc_cluster
FCPROCESS_GrattonLab_forced_data('/Users/dianaperez/Desktop/Lifespan_datalist1.xlsx',↙
'/Users/dianaperez/Desktop/', 'defaults2')
Variant_overlap
unique(varmap_1.data)
Variant_overlap
unique(overlap_map)
template = varmap_1;
template.data = overlap_map;
ft_write_cifti_mod('/Users/dianaperez/Desktop/LS03_longitudinal_variant_overlap.dtseries.↙
nii', template);
template.data = overlap_map';
ft_write_cifti_mod('/Users/dianaperez/Desktop/LS03_longitudinal_variant_overlap.dtseries.↙
nii', template);
operc_cluster
indiv_net_size_by_hems
diff_surf(s,net) = left_hem_surf(s,net) - right_hem_surf(s,net);
indiv_net_size_by_hems
save([output_dir '/HCP384_indiv_network_size_by_hems.mat'], indiv_nets_size)
save↙
('/Users/dianaperez/Desktop/lateralization_code/testing_output/indiv_net_symm/HCP384_indi↙
v_network_size_by_hems.mat', indiv_nets_size)
save↙
('/Users/dianaperez/Desktop/lateralization_code/testing_output/indiv_net_symm/HCP384_indi↙
v_network_size_by_hems.mat', 'indiv_nets_size')
clear all
load↙
```

```
('/Users/dianaperez/Desktop/lateralization_code/testing_output/operc_nets_lefthemcluster_↙
lefthem.mat')
load↙
('/Users/dianaperez/Desktop/lateralization_code/testing_output/operc_nets_lefthemcluster_↙
righthem.mat')
load↙
('/Users/dianaperez/Desktop/lateralization_code/testing_output/operc_nets_righthemcluster↙
_lefthem.mat')
load↙
('/Users/dianaperez/Desktop/lateralization_code/testing_output/operc_nets_righthemcluster↙
_righthem.mat')
clear all
load↙
('/Users/dianaperez/Desktop/lateralization_code/testing_output/operc_nets_righthemcluster↙
_lefthem.mat')
clusterA_LH_nets = RH_cluster;
load↙
('/Users/dianaperez/Desktop/lateralization_code/testing_output/operc_nets_righthemcluster↙
_righthem.mat')
clear all
load↙
('/Users/dianaperez/Desktop/lateralization_code/testing_output/operc_nets_righthemcluster↙
_lefthem.mat')
load↙
('/Users/dianaperez/Desktop/lateralization_code/testing_output/operc_nets_righthemcluster↙
_righthem.mat')
clusterA_RH_nets = RH_cluster;
load↙
('/Users/dianaperez/Desktop/lateralization_code/testing_output/operc_nets_righthemcluster↙
_lefthem.mat')
clusterA_LH_nets = RH_cluster;
load↙
('/Users/dianaperez/Desktop/lateralization_code/testing_output/operc_nets_lefthemcluster_↙
righthem.mat')
clusterB_RH_nets = LH_cluster;
load↙
('/Users/dianaperez/Desktop/lateralization_code/testing_output/operc_nets_lefthemcluster_↙
lefthem.mat')
clusterB_LH_nets = LH_cluster;
clear LH_cluster RH_cluster
rgb_colors = [1 0 0;    %DMN
0 0 .6; %Vis
1 1 0; %FP
0 .8 0; %DAN
0 .6 .6;%VAN
0 0 0;%SAl
.3 0 .6;%CON
.2 1 1;%SMd
1 .5 0;%SMl
.6 .2 1;%Aud
.2 1 .2;%Tpole
0 .2 .4;%MTL
0 0 1; %PMN
.8 .8 .6]; %PON
scatter(clusterA_LH_nets.number, 80, rgb_colors, 'filled')
scatter(16,clusterA_LH_nets.number, 80, rgb_colors, 'filled')
scatter(16,sum(clusterA_LH_nets.number), 80, rgb_colors, 'filled')
scatter(16,sum(clusterA_LH_nets.number,2), 80, rgb_colors, 'filled')
sum(clusterA_LH_nets.number,2)
sum(clusterA_LH_nets.number,1);
```

```
scatter(16,sum(clusterA_LH_nets.number,1), 80, rgb_colors, 'filled')
scatter(1:16,sum(clusterA_LH_nets.number,1), 80, rgb_colors, 'filled')
rgb = [1 0 0; %DMN
0 0 .6; %Vis
1 1 0; %FP
.67 .67 .67; %Unassigned
0 .8 0; %DAN
.67 .67 .67; %Unassigned2
0 .6 .6;%VAN
0 0 0; % Sal
.3 0 .6; %CON
.2 1 1; %SMd
1 .5 0; % SMl
.6 .2 1; %Aud
.2 1 .2; %Tpole
0 .2 .4; %MTL
0 0 1; %PMN
.8 .8 .6]; %PON
scatter(1:16,sum(clusterA_LH_nets.number,1), 80, rgb, 'filled')
figure
scatter(1:16,sum(clusterA_LH_nets.number,1), 80, rgb, 'filled')
close gcf
figure
scatter(1:16,sum(clusterA_LH_nets.number,1), 80, rgb, 'filled')
%-- 1/28/22, 8:41 PM --%
load↙
('/Users/dianaperez/Desktop/lateralization_code/testing_output/operc_nets_righthemcluster↙
_righthem.mat')
clusterA_RH_nets = RH_cluster;
load↙
('/Users/dianaperez/Desktop/lateralization_code/testing_output/operc_nets_righthemcluster↙
_lefthem.mat')
clusterA_LH_nets = RH_cluster;
load↙
('/Users/dianaperez/Desktop/lateralization_code/testing_output/operc_nets_lefthemcluster_↙
righthem.mat')
clusterB_RH_nets = LH_cluster;
load↙
('/Users/dianaperez/Desktop/lateralization_code/testing_output/operc_nets_lefthemcluster_↙
lefthem.mat')
clusterB_LH_nets = LH_cluster;
clear LH_cluster RH_cluster
rgb = [1 0 0; %DMN
0 0 .6; %Vis
1 1 0; %FP
.67 .67 .67; %Unassigned
0 .8 0; %DAN
.67 .67 .67; %Unassigned2
0 .6 .6;%VAN
0 0 0; % Sal
.3 0 .6; %CON
.2 1 1; %SMd
1 .5 0; % SMl
.6 .2 1; %Aud
.2 1 .2; %Tpole
0 .2 .4; %MTL
0 0 1; %PMN
.8 .8 .6]; %PON
figure;
scatter(1:16, RH_cluster.number, 80, rgb, 'filled')
```

```
scatter(1:16, sum(clusterA_LH_nets.number,1), 80, rgb, 'filled')
hold on
scatter(1:16, sum(clusterA_RH_nets.number,1), 80, rgb, 'filled')
close gcf
scatter((.5:1:15.5), sum(clusterA_LH_nets.number,1), 80, rgb, 'filled')
scatter((1.5:1:16.5), sum(clusterA_RH_nets.number,1), 80, rgb, 'filled')
hold on
scatter((.5:1:15.5), sum(clusterA_LH_nets.number,1), 80, rgb, 'filled')
close gcf
scatter((.5:1:15.5), sum(clusterA_LH_nets.number,1), 80, rgb, 'filled')
hold on
scatter((.5:1:15.5), sum(clusterA_LH_nets.number,1), 80, rgb, 'filled')
scatter((1.5:1:16.5), sum(clusterA_RH_nets.number,1), 80, rgb, 'filled')
close gcf
scatter((.75:1:15.75), sum(clusterA_LH_nets.number,1), 80, rgb, 'filled')
hold on
scatter((1.25:1:16.25), sum(clusterA_RH_nets.number,1), 80, rgb, 'filled')
network_names = {'DMN','Vis','FP',' ','DAN','↙
','VAN','Sal','CO','SMd','SMl','Aud','Tpole','MTL','PMN','PON'};
xticklabels(network_names)
close gcf
rgb = [1 0 0; %DMN
0 0 .6; %Vis
1 1 0; %FP
.67 .67 .67; %Unassigned
0 .8 0; %DAN
.67 .67 .67; %Unassigned2
0 .6 .6;%VAN
0 0 0; % Sal
.3 0 .6; %CON
.2 1 1; %SMd
1 .5 0; % SMl
.6 .2 1; %Aud
.2 1 .2; %Tpole
0 .2 .4; %MTL
0 0 1; %PMN
.8 .8 .6]; %PON
network_names = {'DMN','Vis','FP',' ','DAN','↙
','VAN','Sal','CO','SMd','SMl','Aud','Tpole','MTL','PMN','PON'};
scatter((.75:1:15.75), sum(clusterA_LH_nets.number,1), 80, rgb, 'filled')
hold on
scatter((1.25:1:16.25), sum(clusterA_RH_nets.number,1), 80, rgb, 'filled')
xticks([1:16])
xticklabels(network_names)
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.3, 0.9]); %first and second↙
control position on screen, third controls width, and fourth controls height
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.9, 0.5]); %first and second↙
control position on screen, third controls width, and fourth controls height
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.7, 0.5]); %first and second↙
control position on screen, third controls width, and fourth controls height
axis([0, 250, 0, 16.5])
axis([0, 16.5, 0, 250])
axis([0.5, 16.5, 0, 250])
print(gcf, '/Users/dianaperez/Desktop/HCP384_high_asymm_clusterA_nets.jpg', '-dpng', '-↙
r300')
close gcf
scatter((.75:1:15.75), sum(clusterB_LH_nets.number,1), 80, rgb, 'filled')
hold on
scatter((1.25:1:16.25), sum(clusterB_RH_nets.number,1), 80, rgb, 'filled')
xticks([1:16])
```

```
xticklabels(network_names)
axis([0.5, 16.5, 0, 250])
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.7, 0.5]); %first and second↙
control position on screen, third controls width, and fourth controls height
print(gcf, '/Users/dianaperez/Desktop/HCP384_high_asymm_clusterB_nets.jpg', '-dpng', '-↙
r300')
clear all
output_dir =↙
'/Users/dianaperez/Desktop/lateralization_code/testing_output/indiv_net_symm/';
load([output_dir '/HCP384_indiv_network_size_by_hems.mat'])
load↙
('/Users/dianaperez/Desktop/lateralization_code/testing_output/HCP384_LhemvsRhem_num_vert↙
s.mat')
load↙
('/Users/dianaperez/Desktop/lateralization_code/testing_output/HCP384_new_split_variants_↙
info.mat')
clear output_mat
numVerts = variants_info.left_hem.group_avg{:,2};
LH_numVerts = numVerts;
RH_numVerts = variants_info.right_hem.group_avg{:,2};
clear numVerts
load↙
('/Users/dianaperez/Desktop/lateralization_code/testing_output/HCP384_new_split_networksx↙
Hem.mat')
diff_numvars = networksxHem.clustersLH{:,1} - networksxHem.clustersRH{:,1};
networksxHem.clustersRH{:,1}
networksxHem.clustersRH(:,1)
diff_numvars = networksxHem.clustersLH(:,1) - networksxHem.clustersRH(:,1);
indiv_nets_size.left_hem.surf_area(:,1)
for net = 1:16
diff_numvars = networksxHem.clustersLH(:,net) - networksxHem.clustersRH(:,net);
diff_size_nets = indiv_nets_size.left_hem.surf_area(:,net) - indiv_nets_size.right_hem.↙
surf_area(:,net);
r = corr(diff_numvars, diff_size_nets);
end
for net = 1:16
diff_numvars = networksxHem.clustersLH(:,net) - networksxHem.clustersRH(:,net);
diff_size_nets = indiv_nets_size.left_hem.surf_area(:,net) - indiv_nets_size.right_hem.↙
surf_area(:,net);
r(net) = corr(diff_numvars, diff_size_nets);
end
for net = 1:16
diff_numvars = networksxHem.clustersLH(:,net) - networksxHem.clustersRH(:,net);
diff_size_nets = indiv_nets_size.left_hem.surf_area(:,net) - indiv_nets_size.right_hem.↙
surf_area(:,net);
r(net) = corrcoef(diff_numvars, diff_size_nets);
end
corrcoef(diff_numvars, diff_size_nets)
help corrcoef
for net = 1:16
diff_numvars = networksxHem.clustersLH(:,net) - networksxHem.clustersRH(:,net);
diff_size_nets = indiv_nets_size.left_hem.surf_area(:,net) - indiv_nets_size.right_hem.↙
surf_area(:,net);
[r p] = corrcoef(diff_numvars, diff_size_nets);
r_nets(net) = r;
p_nets(net) = p;
end
[r p] = corrcoef(diff_numvars, diff_size_nets);
for net = 1:16
diff_numvars = networksxHem.clustersLH(:,net) - networksxHem.clustersRH(:,net);
```

```
diff_size_nets = indiv_nets_size.left_hem.surf_area(:,net) - indiv_nets_size.right_hem.↙
surf_area(:,net);
[r p] = corrcoef(diff_numvars, diff_size_nets);
r_nets(net) = r(1,2);
p_nets(net) = p(1,2);
end
for net = 1:16
%diff_numvars = networksxHem.clustersLH(:,net) - networksxHem.clustersRH(:,net);
diff_numverts = networksxHem.verticesLH(:,net) - networksxHem.verticesRH(:,net);
diff_size_nets = indiv_nets_size.left_hem.surf_area(:,net) - indiv_nets_size.right_hem.↙
surf_area(:,net);
[r p] = corrcoef(diff_numvars, diff_size_nets);
r_nets(net) = r(1,2);
p_nets(net) = p(1,2);
end
%-- 1/29/22, 12:30 PM --%
output_dir =↙
'/Users/dianaperez/Desktop/lateralization_code/testing_output/indiv_net_symm/';
load([output_dir '/HCP384_indiv_network_size_by_hems.mat'])
load↙
('/Users/dianaperez/Desktop/lateralization_code/testing_output/HCP384_new_split_networksx↙
Hem.mat')
names = {'DMN','Vis','FP',' ','DAN','↙
','VAN','Sal','CO','SMd','SMl','Aud','Tpole','MTL','PMN','PON'};
rgb = [1 0 0; %DMN
0 0 .6; %Vis
1 1 0; %FP
.67 .67 .67; %Unassigned
0 .8 0; %DAN
.67 .67 .67; %Unassigned2
0 .6 .6;%VAN
0 0 0; % Sal
.3 0 .6; %CON
.2 1 1; %SMd
1 .5 0; % SMl
.6 .2 1; %Aud
.2 1 .2; %Tpole
0 .2 .4; %MTL
0 0 1; %PMN
.8 .8 .6]; %PON
scatter(1:16, indiv_nets_size.diff.surf_area, 80, rgb)
diff_surf_area = indiv_nets_size.diff.surf_area
scatter(1:16, diff_surf_area, 80, rgb)
scatter(1:16, diff_surf_area(:,:), 80, rgb)
avg_diff = mean(diff_surf_area);
diff_surf_area(384,:) = avg_diff;
diff_surf_area = indiv_nets_size.diff.surf_area
diff_surf_area(385,:) = avg_diff;
ind = zeros(385,1);
ind(385) = 1;
net_inds = [ind ind ind ind ind ind ind ind ind ind ind ind ind ind ind ind];
handles = plotSpread(diff_surf_area, 'categoryMarkers', {'x', '.'}, 'categoryLabels',↙
{'Indiv_diff_scores','Average'}, 'distributionColors', rgb', 'categoryIdx', net_inds,↙
'xNames', names)
for n = 1:numel(network_names)
rgb_for_plot{n} = rgb_colors(n,:);
end
for n = 1:numel(names)
rgb_for_plot{n} = rgb(n,:);
end
```

```
handles = plotSpread(diff_surf_area, 'categoryMarkers', {'x', '.'}, 'categoryLabels',↙
{'Indiv_diff_scores','Average'}, 'distributionColors', rgb_for_plot', 'categoryIdx',↙
net_inds, 'xNames', names)
hold on
scatter(1:16, avg_diff, 'MarkerEdgeColor', 'k', 'MarkerFaceColor', 'k', 'SizeData', 50)
scatter(8,avg_diff(1,6), 'MarkerEdgeColor', 'w', 'MarkerFaceColor', 'w', 'SizeData', 50)
ylabel('Difference in surface area of individual-specific networks')
load↙
('/Users/dianaperez/Desktop/lateralization_code/testing_output/HCP384_new_split_networksx↙
Hem.mat')
diff_numverts = networksxHem.verticesLH(:,net) - networksxHem.verticesRH(:,net);
for net = 1:16
diff_numvars = networksxHem.clustersLH(:,net) - networksxHem.clustersRH(:,net);
%diff_numverts = networksxHem.verticesLH(:,net) - networksxHem.verticesRH(:,net);
diff_size_nets = indiv_nets_size.left_hem.surf_area(:,net) - indiv_nets_size.right_hem.↙
surf_area(:,net);
[r p] = corrcoef(diff_numvars, diff_surf_area(384,:));
r_nets(net) = r(1,2);
p_nets(net) = p(1,2);
end
indiv_net_size_by_hems
for net = 1:16
diff_numvars = networksxHem.clustersLH(:,net) - networksxHem.clustersRH(:,net);
%diff_numverts = networksxHem.verticesLH(:,net) - networksxHem.verticesRH(:,net);
diff_size_nets = indiv_nets_size.left_hem.surf_area(:,net) - indiv_nets_size.right_hem.↙
surf_area(:,net);
[r p] = corrcoef(diff_numvars, diff_size_nets);
r_nets(net) = r(1,2);
p_nets(net) = p(1,2);
end
load↙
('/Users/dianaperez/Desktop/lateralization_code/testing_output/HCP384_new_split_networksx↙
Hem.mat')
for net = 1:16
diff_numvars = networksxHem.clustersLH(:,net) - networksxHem.clustersRH(:,net);
%diff_numverts = networksxHem.verticesLH(:,net) - networksxHem.verticesRH(:,net);
diff_size_nets = indiv_nets_size.left_hem.surf_area(:,net) - indiv_nets_size.right_hem.↙
surf_area(:,net);
[r p] = corrcoef(diff_numvars, diff_size_nets);
r_nets(net) = r(1,2);
p_nets(net) = p(1,2);
end
load([output_dir '/HCP384_indiv_network_size_by_hems.mat'])
for net = 1:16
diff_numvars = networksxHem.clustersLH(:,net) - networksxHem.clustersRH(:,net);
%diff_numverts = networksxHem.verticesLH(:,net) - networksxHem.verticesRH(:,net);
diff_size_nets = indiv_nets_size.left_hem.surf_area(:,net) - indiv_nets_size.right_hem.↙
surf_area(:,net);
[r p] = corrcoef(diff_numvars, diff_size_nets);
r_nets(net) = r(1,2);
p_nets(net) = p(1,2);
end
plot(diff_numvars, diff_size_nets)
close gcf
plot(diff_numvars, diff_size_nets)
scatter(diff_numvars, diff_size_nets)
help polyfit
hold on
p = polyfit(diff_numvars, diff_size_nets,1);
px = [min(diff_numvars) max(diff_numvars)];
```

```
py = polyval(p, px);
plot(px, py, 'LineWidth', 2);
help corr
[r p] = corr(diff_numvars, diff_size_nets)
indiv_net_size_by_hems
title(names{net});
indiv_net_size_by_hems
%-- 1/29/22, 3:48 PM --%
indiv_net_size_by_hems
high_asymmetry_clusters
load('HCP384_variant_maps.mat')
unique(variant_map_mat)
gifti = insert_nonbrain(variant_map_mat, 'both', template);
gifti = insert_nonbrain(variant_map_mat(:,:), 'both', template);
open insert_nonbrain
gifti = insert_nonbrain(variant_map_mat(:,:), 'both', template);
gifti = insert_nonbrain(variant_map_mat, 'both', template);
high_asymmetry_clusters
[data_dir num2str(subs(sub)) netvarmap_str]
high_asymmetry_clusters
unique_IDs_LH = unique_IDs_mat(1:32492,:);
unique_IDs_RH = unique_IDs_mat(32493:end,:);
net_assign_LH = net_assign_mat(1:32492, :);
net_assign_RH = net_assign_mat(32493:end, :);
length(unique_IDs_LH)
size(unique_IDs_LH,2)
clusterA = [];
clusterA.left_hem.proportion = length(unique_IDs_LH);
clusterA.left_hem.proportion(1) = length(unique_IDs_LH);
high_asymmetry_clusters
for sub = 1:size(unique_IDs_LH,2)
%% LEFT HEM
[subInfo, clusterA.left_hem.proportion(sub,:), clusterA.left_hem.number(sub,:)] =↙
extract_nets(unique_IDs_LH, net_assign_LH, clusterA_seed);
clusterA_LH = [clusterA_LH; subInfo];
[subInfo, clusterA.right_hem.proportion(sub,:), clusterA.right_hem.number(sub,:)] =↙
extract_nets(unique_IDs_RH, net_assign_RH, clusterA_seed);
clusterA_RH = [clusterA_RH; subInfo];
[subInfo, clusterB.left_hem.proportion(sub,:), clusterB.left_hem.number(sub,:)] =↙
extract_nets(unique_IDs_LH, net_assign_LH, clusterB_seed);
clusterB_LH = [clusterB_LH; subInfo];
[subInfo, clusterB.right_hem.proportion(sub,:), clusterB.right_hem.number(sub,:)] =↙
extract_nets(unique_IDs_RH, net_assign_RH, clusterB_seed);
clusterB_RH = [clusterB_RH; subInfo];
end
high_asymmetry_clusters
close gcf
network_names = {'DMN','Vis','FP',' ','DAN','↙
','VAN','Sal','CO','SMd','SMl','Aud','Tpole','MTL','PMN','PON'};
scatter((.75:1:15.75), sum(clusterA.left_hem.number,1), 80, rgb, 'filled')
hold on
scatter((1.25:1:16.25), sum(clusterA.right_hem.number,1), 80, rgb, 'filled')
xticks([1:16])
xticklabels(network_names)
axis([0.5, 16.5, 0, 250])
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.7, 0.5]); %first and second↙
control position on screen, third controls width, and fourth controls height
print(gcf, '/Users/dianaperez/Desktop/HCP384_high_asymm_clusterA_nets.jpg', '-dpng', '-↙
r300')
close gcf
```

```
scatter((.75:1:15.75), sum(clusterB.left_hem.number,1), 80, rgb, 'filled')
hold on
scatter((1.25:1:16.25), sum(clusterB.right_hem.number,1), 80, rgb, 'filled')
xticks([1:16])
xticklabels(network_names)
axis([0.5, 16.5, 0, 250])
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.7, 0.5]); %first and second↙
control position on screen, third controls width, and fourth controls height
print(gcf, '/Users/dianaperez/Desktop/HCP384_high_asymm_clusterB_nets.jpg', '-dpng', '-↙
r300')
close gcf
scatter((.75:1:15.75), sum(clusterA.left_hem.number,1), 80, rgb, 'filled')
hold on
scatter((1.25:1:16.25), sum(clusterA.right_hem.number,1), 80, rgb, 'filled')
xticks([1:16])
xticklabels(network_names)
max_ax = max(clusterA.left_hem.number)+(std(clusterA.left_hem.number)/2);
min_ax = min(clusterA.left_hem.number)-(std(clusterA.left_hem.number)/2);
max_ax = max(max(clusterA.left_hem.number))+(min((std(clusterA.left_hem.number)/2));
max_ax = max(max(clusterA.left_hem.number))+(min((std(clusterA.left_hem.number)/2)));
max_ax = max(max(sum(clusterA.left_hem.number,1)))+(min((std(sum(clusterA.left_hem.↙
number))/2));
max_ax = max(max(sum(clusterA.left_hem.number,1)))+(min((std(sum(clusterA.left_hem.↙
number))/2)));
min_ax = min(min(sum(clusterA.left_hem.number,1)))+(min((std(sum(clusterA.left_hem.↙
number))/2)));
axis([0.5, 16.5, min_ax, max_ax])
min_ax = min(min(sum(clusterA.left_hem.number,1)))-(min((std(sum(clusterA.left_hem.↙
number))/2)));
axis([0.5, 16.5, min_ax, max_ax])
close gcf
scatter((.75:1:15.75), sum(clusterA.left_hem.number,1), 80, rgb, 'filled')
hold on
scatter((1.25:1:16.25), sum(clusterA.right_hem.number,1), 80, rgb, 'filled')
xticks([1:16])
xticklabels(network_names)
max_ax = max(max(sum(clusterA.left_hem.number,1)))+(min((std(sum(clusterA.left_hem.↙
number))/2)));
min_ax = min(min(sum(clusterA.left_hem.number,1)))-(min((std(sum(clusterA.left_hem.↙
number))/2)));
axis([0.5, 16.5, min_ax, max_ax])
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.7, 0.5]); %first and second↙
control position on screen, third controls width, and fourth controls height
print(gcf, '/Users/dianaperez/Desktop/HCP384_high_asymm_clusterA_nets.jpg', '-dpng', '-↙
r300')
close gcf
scatter((.75:1:15.75), sum(clusterA.left_hem.number,1), 80, rgb)
hold on
scatter((1.25:1:16.25), sum(clusterA.right_hem.number,1), 80, rgb, 'filled')
xticks([1:16])
xticklabels(network_names)
max_ax = max(max(sum(clusterA.left_hem.number,1)))+(min((std(sum(clusterA.left_hem.↙
number))/2)));
min_ax = min(min(sum(clusterA.left_hem.number,1)))-(min((std(sum(clusterA.left_hem.↙
number))/2)));
axis([0.5, 16.5, min_ax, max_ax])
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.7, 0.5]); %first and second↙
control position on screen, third controls width, and fourth controls height
print(gcf, '/Users/dianaperez/Desktop/HCP384_high_asymm_clusterA_nets.jpg', '-dpng', '-↙
r300')
```

```
scatter((.75:1:15.75), sum(clusterA.left_hem.number,1), 80, rgb, 'd', 'filled')
scatter((.75:1:15.75), sum(clusterA.left_hem.number,1), 80, rgb, 'd', 'filled')
hold on
scatter((1.25:1:16.25), sum(clusterA.right_hem.number,1), 80, rgb, 'filled')
xticks([1:16])
xticklabels(network_names)
max_ax = max(max(sum(clusterA.left_hem.number,1)))+(min((std(sum(clusterA.left_hem.↙
number))/2)));
min_ax = min(min(sum(clusterA.left_hem.number,1)))-(min((std(sum(clusterA.left_hem.↙
number))/2)));
axis([0.5, 16.5, min_ax, max_ax])
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.7, 0.5]); %first and second↙
control position on screen, third controls width, and fourth controls height
print(gcf, '/Users/dianaperez/Desktop/HCP384_high_asymm_clusterA_nets.jpg', '-dpng', '-↙
r300')
close gcf
scatter((.75:1:15.75), sum(clusterB.left_hem.number,1), 80, rgb, 'd', 'filled')
hold on
scatter((1.25:1:16.25), sum(clusterB.right_hem.number,1), 80, rgb, 'filled')
xticks([1:16])
xticklabels(network_names)
max_ax = max(max(sum(clusterB.left_hem.number,1)))+(min((std(sum(clusterB.left_hem.↙
number))/2)));
min_ax = min(min(sum(clusterB.left_hem.number,1)))-(min((std(sum(clusterB.left_hem.↙
number))/2)));
axis([0.5, 16.5, 0, 250])
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.7, 0.5]); %first and second↙
control position on screen, third controls width, and fourth controls height
print(gcf, '/Users/dianaperez/Desktop/HCP384_high_asymm_clusterB_nets.jpg', '-dpng', '-↙
r300')
max_ax = max(max(sum(clusterB.left_hem.number,1)))+(min((std(sum(clusterB.left_hem.↙
number))/2)));
min_ax = min(min(sum(clusterB.left_hem.number,1)))-(min((std(sum(clusterB.left_hem.↙
number))/2)));
axis([0.5, 16.5, 0, 250])
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.7, 0.5]); %first and second↙
control position on screen, third controls width, and fourth controls height
print(gcf, '/Users/dianaperez/Desktop/HCP384_high_asymm_clusterB_nets.jpg', '-dpng', '-↙
r300')
axis([0.5, 16.5, min_ax, max_ax])
print(gcf, '/Users/dianaperez/Desktop/HCP384_high_asymm_clusterB_nets.jpg', '-dpng', '-↙
r300')
close gcf
scatter((.75:1:15.75), sum(clusterB.left_hem.number,1), 80, rgb, 'd', 'filled')
hold on
scatter((1.25:1:16.25), sum(clusterB.right_hem.number,1), 80, rgb, 'filled')
xticks([1:16])
xticklabels(network_names)
max_ax = max(max(sum(clusterB.left_hem.number,1)))+(min((std(sum(clusterB.left_hem.↙
number))/2)));
min_ax = min(min(sum(clusterB.left_hem.number,1)))-(min((std(sum(clusterB.left_hem.↙
number))/2)));
axis([0.5, 16.5, min_ax, max_ax])
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.7, 0.5]); %first and second↙
control position on screen, third controls width, and fourth controls height
print(gcf, '/Users/dianaperez/Desktop/HCP384_high_asymm_clusterB_nets.jpg', '-dpng', '-↙
r300')
scatter((.75:1:15.75), sum(clusterA.left_hem.proportion,1), 80, rgb, 'd', 'filled')
hold on
scatter((1.25:1:16.25), sum(clusterA.right_hem.proportion,1), 80, rgb, 'filled')
```

```
xticks([1:16])
xticklabels(network_names)
max_ax = max(max(sum(clusterA.left_hem.proportion,1)))+(min((std(sum(clusterA.left_hem.↙
proportion))/2)));
min_ax = min(min(sum(clusterA.left_hem.proportion,1)))-(min((std(sum(clusterA.left_hem.↙
proportion))/2)));
axis([0.5, 16.5, min_ax, max_ax])
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.7, 0.5]); %first and second↙
control position on screen, third controls width, and fourth controls height
print(gcf, '/Users/dianaperez/Desktop/HCP384_high_asymm_clusterA_nets_proportion.jpg', '-↙
dpng', '-r300')
var_freq_size_net
surf_areas_LHem(verts)
sum(surf_areas_LHem(verts))
sum(surf_areas_LHem)
sum(surf_areas_LHem(verts))/sum(surf_areas_LHem)
272.1685/6.3782e+04
var_freq_size_net
perms_var_freq_size
permute_net_assignment
high_asymmetry_clusters
scatter((.75:1:13.75), sum(good_nets_LH,1), 150, rgb, 'd', 'filled')
hold on
scatter((1.25:1:14.25), sum(good_nets_RH,1), 150, rgb, 'filled')
xticks([1:16])
xticklabels(network_names)
max_ax = max(max(sum(good_nets_LH,1)))+(min((std(sum(good_nets_LH))/2)));
min_ax = min(min(sum(good_nets_LH,1)))-(min((std(sum(good_nets_LH))/2)));
axis([0.5, 16.5, min_ax, max_ax])
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.7, 0.5]); %first and second↙
control position on screen, third controls width, and fourth controls height
print(gcf, '/Users/dianaperez/Desktop/HCP384_high_asymm_clusterA_nets.jpg', '-dpng', '-↙
r300')
xticks([1:14])
axis([0.5, 14.5, min_ax, max_ax])
print(gcf, '/Users/dianaperez/Desktop/HCP384_high_asymm_clusterA_nets.jpg', '-dpng', '-↙
r300')
close gcf
good_nets_LH = [clusterB.left_hem.number(:,1:3) clusterB.left_hem.number(:,5) clusterB.↙
left_hem.number(:,7:end)];
good_nets_RH = [clusterB.right_hem.number(:,1:3) clusterB.right_hem.number(:,5) clusterB.↙
right_hem.number(:,7:end)];
scatter((.75:1:13.75), sum(good_nets_LH,1), 150, rgb, 'd', 'filled')
hold on
scatter((1.25:1:14.25), sum(good_nets_RH,1), 150, rgb, 'filled')
xticks([1:16])
xticklabels(network_names)
max_ax = max(max(sum(good_nets_LH,1)))+(min((std(sum(good_nets_LH))/2)));
min_ax = min(min(sum(good_nets_LH,1)))-(min((std(sum(good_nets_LH))/2)));
axis([0.5, 16.5, min_ax, max_ax])
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.7, 0.5]); %first and second↙
control position on screen, third controls width, and fourth controls height
print(gcf, '/Users/dianaperez/Desktop/HCP384_high_asymm_clusterB_nets.jpg', '-dpng', '-↙
r300')
xticks([1:14])
axis([0.5, 14.5, min_ax, max_ax])
max_ax = max(max(sum(good_nets_RH,1)))+(min((std(sum(good_nets_RH))/2)));
min_ax = min(min(sum(good_nets_rH,1)))-(min((std(sum(good_nets_RH))/2)));
axis([0.5, 14.5, min_ax, max_ax])
max_ax = max(max(sum(good_nets_RH,1)))+(min((std(sum(good_nets_RH))/2)));
```

```
min_ax = min(min(sum(good_nets_RH,1)))-(min((std(sum(good_nets_RH))/2)));
axis([0.5, 14.5, min_ax, max_ax])
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.7, 0.5]); %first and second↙
control position on screen, third controls width, and fourth controls height
print(gcf, '/Users/dianaperez/Desktop/HCP384_high_asymm_clusterB_nets.jpg', '-dpng', '-↙
r300')
ax = gca;
ax.FontSize = 24;
print(gcf, '/Users/dianaperez/Desktop/HCP384_high_asymm_clusterB_nets.jpg', '-dpng', '-↙
r300')
close gcf
network_names =↙
{'DMN','Vis','FP','DAN','VAN','Sal','CO','SMd','SMl','Aud','Tpole','MTL','PMN','PON'};
good_nets_LH = [clusterA.left_hem.number(:,1:3) clusterA.left_hem.number(:,5) clusterA.↙
left_hem.number(:,7:end)];
good_nets_RH = [clusterA.right_hem.number(:,1:3) clusterA.right_hem.number(:,5) clusterA.↙
right_hem.number(:,7:end)];
scatter((.75:1:13.75), sum(good_nets_LH,1), 150, rgb, 'd', 'filled')
hold on
scatter((1.25:1:14.25), sum(good_nets_RH,1), 150, rgb, 'filled')
xticks([1:14])
xticklabels(network_names)
max_ax = max(max(sum(good_nets_LH,1)))+(min((std(sum(good_nets_LH))/2)));
min_ax = min(min(sum(good_nets_LH,1)))-(min((std(sum(good_nets_LH))/2)));
axis([0.5, 14.5, min_ax, max_ax])
ax = gca;
ax.FontSize = 24;
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.7, 0.5]); %first and second↙
control position on screen, third controls width, and fourth controls height
print(gcf, '/Users/dianaperez/Desktop/HCP384_high_asymm_clusterA_nets.jpg', '-dpng', '-↙
r300')
close gcf
good_nets_LH = [clusterB.left_hem.number(:,1:3) clusterB.left_hem.number(:,5) clusterB.↙
left_hem.number(:,7:end)];
good_nets_RH = [clusterB.right_hem.number(:,1:3) clusterB.right_hem.number(:,5) clusterB.↙
right_hem.number(:,7:end)];
scatter((.75:1:13.75), sum(good_nets_LH,1), 150, rgb, 'd', 'filled')
hold on
scatter((1.25:1:14.25), sum(good_nets_RH,1), 150, rgb, 'filled')
xticks([1:14])
xticklabels(network_names)
max_ax = max(max(sum(good_nets_RH,1)))+(min((std(sum(good_nets_RH))/2)));
min_ax = min(min(sum(good_nets_RH,1)))-(min((std(sum(good_nets_RH))/2)));
axis([0.5, 14.5, min_ax, max_ax])
ax = gca;
ax.FontSize = 24;
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.7, 0.5]); %first and second↙
control position on screen, third controls width, and fourth controls height
print(gcf, '/Users/dianaperez/Desktop/HCP384_high_asymm_clusterB_nets.jpg', '-dpng', '-↙
r300')
Overlap_VANvars
permute_net_assignment
var_freq_size_net
permute_net_assignment
indiv_net_size_by_hems
diff_numvars_all = [];
diff_sizenets_all = [];
for net = 1:16
%diff_numvars = networksxHem.clustersLH(:,net) - networksxHem.clustersRH(:,net);
diff_numvars = networksxHem.verticesLH(:,net) - networksxHem.verticesRH(:,net);
```

```
diff_size_nets = indiv_nets_size.left_hem.surf_area(:,net) - indiv_nets_size.right_hem.↙
surf_area(:,net);
diff_numvars_all = [diff_numvars_all; diff_numvars];
diff_sizenets_all = [diff_sizenets_all; diff_size_nets];
[r p] = corr(diff_numvars, diff_size_nets);
rvals(net) = r;
pvals(net) = p;
end
[p_fdr, p_masked] = FDR(pvals, 0.025)
[r_all, p_all] = corr(diff_numvars_all, diff_sizenets_all);
%-- 1/31/22, 6:08 PM --%
indiv_net_size_by_hems
find(diff_numvars==nan)
find(diff_size_nets==nan)
unique
unique(diff_numvars)
unique(diff_size_nets)
unique(diff_surf_area)
find(isnan(diff_numvars))
find(isnan(diff_size_nets))
[r p] = corrcoef(diff_numvars, diff_size_nets);
[r p] = corr(diff_numvars, diff_size_nets, 'rows', 'complete')
doc corr
unique(diff_numvars)
permute_net_assignment
[p_fdr p_masked] = FDR(p_vals, .025);
permute_net_assignment
load↙
('/Users/dianaperez/Desktop/Lateralization/Variant_Properties/HCP752_new_split_RH_network↙
sxHem.mat')
load↙
('/Users/dianaperez/Desktop/Lateralization/Variant_Properties/HCP752_new_split_LH_network↙
sxHem.mat')
LHand_info = load↙
('/Users/dianaperez/Desktop/Lateralization/Variant_Properties/HCP752_new_split_LH_network↙
sxHem.mat')
RHand_info = load↙
('/Users/dianaperez/Desktop/Lateralization/Variant_Properties/HCP752_new_split_RH_network↙
sxHem.mat')
permute_net_assignment
LHand_info = load↙
('/Users/dianaperez/Desktop/Lateralization/Variant_Properties/HCP752_new_split_LH_network↙
sxHem.mat')
RHand_info = load↙
('/Users/dianaperez/Desktop/Lateralization/Variant_Properties/HCP752_new_split_RH_network↙
sxHem.mat')
%-- 1/31/22, 8:19 PM --%
permute_net_assignment
[p_fdr p_masked] = FDR(p_vals, .025);
permute_net_assignment
%-- 2/2/22, 10:05 PM --%
net_specific_diffmap
[varmap_loc num2str(LH(n,1)) net_assign_str]
net_specific_diffmap
size(LHand_net_assign)
net_specific_diffmap
[output_dir group_str{group} '_' network_names{network_id} '_Variants_Overlap.dtseries.↙
nii']
net_specific_diffmap
unique(LH_overlap_map)
```

```
unique(Rh_overlap_map)
unique(RH_overlap_map)
unique9
unique(diff_map)
unique(LH_overlap_map)
unique(RH_overlap_map)
permute_net_assignment
addpath '/Users/dianaperez/Documents/GitHub/PerezEtAl_HemAsymmetries/needed_files'
[p_fdr p_masked] = FDR(p_vals, .025);
network_names =↙
{'DMN','Vis','FP','DAN','VAN','Sal','CO','SMd','SMl','Aud','Tpole','MTL','PMN','PON'};
rgb_colors = [1 0 0; %DMN
0 0 .6; %Vis
1 1 0; %FP
0 .8 0; %DAN
0 .6 .6;%VAN
0 0 0; % Sal
.3 0 .6; %CON
.2 1 1; %SMd
1 .5 0; % SMl
.6 .2 1; %Aud
.2 1 .2; %Tpole
0 .2 .4; %MTL
0 0 1; %PMN
.8 .8 .6]; %PON
good_nets = [output_mat(:,1:3) output_mat(:,5) output_mat(:,7:end)];
rgb_for_plot = {};
for n = 1:numel(network_names)
rgb_for_plot{n} = rgb_colors(n,:);
end
ind = zeros(numperms+1,1);
ind(1,1) = 1;
net_inds = [ind ind ind ind ind ind ind ind ind ind ind ind ind ind];
handles = plotSpread(good_nets, 'categoryMarkers', {'x', '.'}, 'categoryLabels',↙
{'Permuted Differences','True Difference'}, 'distributionColors', rgb_for_plot',↙
'categoryIdx', net_inds, 'xNames', network_names)
ax = gca;
ax.FontSize = 24;
scatter([1:14],good_nets(1,:), 'MarkerEdgeColor', 'k', 'MarkerFaceColor', 'k',↙
'SizeData', 50)
scatter(6,good_nets(1,6), 'MarkerEdgeColor', 'w', 'MarkerFaceColor', 'w', 'SizeData', 50)
ylabel('Difference in Number of Variants')
xlabel('Assigned Network')
min_ax = min(min(good_nets(:,:)))-(min(std(good_nets)/2));
max_ax = max(max(good_nets(:,:)))+(min(std(good_nets)/2));
axis([0, 15, min_ax, max_ax])
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.9, 0.7]);
print(gcf,[output_dir out_str '_PermutationTesting_networkAssignment.jpg'],'-dpng','-↙
r300');
perms_var_freq_size
permute_net_assignment
indiv_net_size_by_hems
net_specific_diffmap
numsubs = size(LHand_net_assign/1);
numsubs = size(LHand_net_assign,1);
numsubs = size(LHand_net_assign,2);
net_specific_diffmap
indiv_net_size_by_hems
p = polyfit(diff_numvars, diff_size_nets,1);
px = [min(diff_numvars) max(diff_numvars)];
```

```
py = polyval(p, px);
plot(px, py, 'LineWidth', 2);
title(names{net});
scatter(diff_numvars, diff_size_nets)
hold on
p = polyfit(diff_numvars, diff_size_nets,1);
px = [min(diff_numvars) max(diff_numvars)];
py = polyval(p, px);
plot(px, py, 'LineWidth', 2);
title(names{net});
indiv_net_size_by_hems
diff_numvars = networksxHem.verticesLH(:,net) - networksxHem.verticesRH(:,net);
diff_size_nets = indiv_nets_size.left_hem.surf_area(:,net) - indiv_nets_size.right_hem.↙
surf_area(:,net);
diff_numvars_all = [diff_numvars_all; diff_numvars];
diff_sizenets_all = [diff_sizenets_all; diff_size_nets];
[r p] = corr(diff_numvars, diff_size_nets);
rvals(net) = r;
pvals(net) = p;
scatter(diff_numvars, diff_size_nets)
hold on
p = polyfit(diff_numvars, diff_size_nets,1);
px = [min(diff_numvars) max(diff_numvars)];
py = polyval(p, px);
plot(px, py, 'LineWidth', 2);
title(names{net});
close gcf
diff_numvars = networksxHem.verticesLH(:,net) - networksxHem.verticesRH(:,net);
diff_size_nets = indiv_nets_size.left_hem.surf_area(:,net) - indiv_nets_size.right_hem.↙
surf_area(:,net);
diff_numvars_all = [diff_numvars_all; diff_numvars];
diff_sizenets_all = [diff_sizenets_all; diff_size_nets];
[r p] = corr(diff_numvars, diff_size_nets);
rvals(net) = r;
pvals(net) = p;
scatter(diff_numvars, diff_size_nets)
hold on
p = polyfit(diff_numvars, diff_size_nets,1);
px = [min(diff_numvars) max(diff_numvars)];
py = polyval(p, px);
plot(px, py, 'LineWidth', 2);
title(names{net});
xlabel('Difference in number of Variant Vertices (Left-Right Hem)');
ylabel('Difference in Network Surface Area in mm^2 (Left-Right Hem)');
diff_numvars = networksxHem.clustersLH(:,net) - networksxHem.clustersRH(:,net);
%diff_numvars = networksxHem.verticesLH(:,net) - networksxHem.verticesRH(:,net);
diff_size_nets = indiv_nets_size.left_hem.surf_area(:,net) - indiv_nets_size.right_hem.↙
surf_area(:,net);
diff_numvars_all = [diff_numvars_all; diff_numvars];
diff_sizenets_all = [diff_sizenets_all; diff_size_nets];
[r p] = corr(diff_numvars, diff_size_nets);
rvals(net) = r;
pvals(net) = p;
scatter(diff_numvars, diff_size_nets)
hold on
p = polyfit(diff_numvars, diff_size_nets,1);
px = [min(diff_numvars) max(diff_numvars)];
py = polyval(p, px);
plot(px, py, 'LineWidth', 2);
title(names{net});
```

```
xlabel('Difference in number of Variant Regions (Left-Right Hem)');
ylabel('Difference in Network Surface Area in mm^2(Left-Right Hem)');
close gcf
diff_numvars = networksxHem.clustersLH(:,net) - networksxHem.clustersRH(:,net);
%diff_numvars = networksxHem.verticesLH(:,net) - networksxHem.verticesRH(:,net);
diff_size_nets = indiv_nets_size.left_hem.surf_area(:,net) - indiv_nets_size.right_hem.↙
surf_area(:,net);
diff_numvars_all = [diff_numvars_all; diff_numvars];
diff_sizenets_all = [diff_sizenets_all; diff_size_nets];
[r p] = corr(diff_numvars, diff_size_nets);
rvals(net) = r;
pvals(net) = p;
scatter(diff_numvars, diff_size_nets)
hold on
p = polyfit(diff_numvars, diff_size_nets,1);
px = [min(diff_numvars) max(diff_numvars)];
py = polyval(p, px);
plot(px, py, 'LineWidth', 2);
title(names{net});
xlabel('Difference in number of Variant Regions (Left-Right Hem)');
ylabel('Difference in Network Surface Area in mm^2(Left-Right Hem)');
indiv_net_size_by_hems
[r,p] = corr(diff_numvars_all, diff_sizenets_all)
indiv_net_size_by_hems
al_goodplot(diff_surf_area, [1:16], .5, rgb_for_plot, 'bilateral', [], [])
al_goodplot(diff_surf_area, [1:16], .5, rgb_for_plot, 'bilateral')
al_goodplot(diff_surf_area, [1:16], .5, rgb, 'bilateral')
close gcf
al_goodplot(diff_surf_area, [1:2:32], .5, rgb, 'bilateral')
ylabel('Difference in surface area of individual-specific networks')
close gcf
al_goodplot(diff_surf_area, [1:2:32], .5, rgb, 'bilateral')
close gcf
al_goodplot(diff_surf_area(:,1), [ ], .5, rgb(1,:), 'bilateral')
al_goodplot
permute_net_assignment
DMN_verts = allSubs_info.networksxHem.verticesLH - allSubs_info.networksxHem.verticesRH;
close gcf
al_goodplot(DMN_verts(:,1), [ ], .5, rgb(1,:), 'bilateral')
rgb = [1 0 0; %DMN
0 0 .6; %Vis
1 1 0; %FP
.67 .67 .67; %Unassigned
0 .8 0; %DAN
.67 .67 .67; %Unassigned2
0 .6 .6;%VAN
0 0 0; % Sal
.3 0 .6; %CON
.2 1 1; %SMd
1 .5 0; % SMl
.6 .2 1; %Aud
.2 1 .2; %Tpole
0 .2 .4; %MTL
0 0 1; %PMN
.8 .8 .6]; %PON
al_goodplot(DMN_verts(:,1), [ ], .5, rgb(1,:), 'bilateral')
indiv_net_size_by_hems
[r,p] = corr(diff_numvars_all, diff_sizenets_all)
permute_net_assignment
diff = left - right;
```

```
mean(diff)
permute_net_assignment
var_freq_size_net
sessions = [4:8, 6:10, 6:10, 1:5, 1:5, 1:5];
sessions(2)
sessions = [4:8; 6:10; 6:10; 1:5; 1:5; 1:5];
length(sessions(2)
length(sessions(2))
length(sessions(2,:))
similarity_analysis_forced_same_amt_data
%-- 2/4/22, 3:49 PM --%
similarity_analysis_forced_same_amt_data
figure('Position',[1 1 1000 800]);
imagesc(simmat,[0 1]); colormap('jet');
hline_new([5,10,15,20,25,30]+0.5,'k',2);
vline_new([5,10,15,20,25,30]+0.5,'k',2);
set(gca,'XTick',[4,13.5,19,24.5,30.5,34,37,40,45], 'YTick',↙
[4,13.5,19,24.5,30.5,34,37,40,45], 'XTickLabel',...
{'LS02', 'LS03', 'LS04', 'LS05', 'LS07', 'LS08', 'LS10', 'LS11', 'LS14'}, 'YTickLabel',↙
{'LS02', 'LS03', 'LS04', 'LS05', 'LS07', 'LS08', 'LS10', 'LS11', 'LS14'});
set(gca,'XTick',[3, 8, 13, 18, 23, 28], 'YTick', [3, 8, 13, 18, 23, 28], 'XTickLabel',...
{'LS02', 'LS03', 'LS05', 'LS08', 'LS11', 'LS14'}, 'YTickLabel', {'LS02', 'LS03', 'LS05',↙
'LS08', 'LS11', 'LS14'});
axis square;
colorbar;
title('Correlation Matrix Similarity');
saveas(gcf,[outDir 'SimilarityMat_rest_matched_data.tiff'],'tiff');
outDir = '/Users/dianaperez/Desktop/';
saveas(gcf,[outDir 'SimilarityMat_rest_matched_data.tiff'],'tiff');
close all
%-- 2/8/22, 10:01 AM --%
indiv_net_size_by_hems
numvars = networksxHem.clustersLH(:,net) + networksxHem.clustersRH(:,net);
size_nets = indiv_nets_size.left_hem.surf_area(:,net) + indiv_nets_size.right_hem.↙
surf_area(:,net);
indiv_net_size_by_hems
[r p] = corr(diff_numvars_all, diff_size_nets_all)
[r p] = corr(diff_numvars_all, diff_sizenets_all)
scatter(diff_numvars_all, diff_sizenets_all)
hold on
p = polyfit(diff_numvars_all, diff_sizenets_all,1);
px = [min(diff_numvars_all) max(diff_numvars_all)];
py = polyval(p, px);
plot(px, py, 'LineWidth', 2);
indiv_net_size_by_hems
diff_surf_area(:,6) = [];
indiv_net_size_by_hems
close gcf
indiv_net_size_by_hems
title('All networks (Left Hem');
title('All networks (Left Hem)');
indiv_net_size_by_hems
EmReg_task
PsychHID('Devices')
EmReg_task
sca
PsychHID('Devices')
EmReg_task
sca
%-- 2/8/22, 1:01 PM --%
```

```
EmReg_task
sca
%-- 2/8/22, 1:02 PM --%
EmReg_task
sca
clear PsychHID
clear KbCheck
EmReg_task
sca
%-- 2/8/22, 1:06 PM --%
EmReg_task
DrawFormattedText(window, emotions_table{emo,1}, xCenter/2, (yCenter-(yCenter/3)), -1);
DrawFormattedText(window, emotions_table{emo,1}, xCenter/4, (yCenter-(yCenter/3)), -1);
DrawFormattedText(window, emotions_table{emo,1}, xCenter/2, (yCenter-(yCenter/3)), -1);
Screen('Flip', window);
Screen('Close')
Screen('Close');
Screen('Close', window);
DrawFormattedText(window, emotions_table{emo,1}, xCenter/4, (yCenter-(yCenter/3)), -1);
EmReg_task
DrawFormattedText(window, emotions_table{emo,1}, xCenter/2, (yCenter-(yCenter/3)), -1);
DrawFormattedText(window, emotions_table{emo,3}, xCenter/2, yCenter, 0);
Screen('Flip', window);
DrawFormattedText(window, emotions_table{emo,1}, 'center', 'center', -1);
Screen('Flip', window);
DrawFormattedText(window, emotions_table{emo,1}, 'center', 'center'/3, -1);
DrawFormattedText(window, emotions_table{emo,1}, 'center', (yCenter-(yCenter/3)), -1);
DrawFormattedText(window, emotions_table{emo,3}, 'center', yCenter, 0);
Screen('Flip', window);
number = GetEchoNumber(window, 'Enter a number, then press RETURN', 'center', yCenter,↙
[0,0,0], [], -1)
EmReg_task
GetEchoNumber
EmReg_task
double(output)
x = 0;
Screen('DrawText', 10, double(output), 0, 540, [0,0,0], [1,1,1])
Screen('Flip', 10, 0, 1)
Screen('DrawText', 10, double(output), 540, 540, [0,0,0], [1,1,1])
Screen('Flip', 10, 0, 1)
Screen('DrawText', 10, double(output), 550, 540, [0,0,0], [1,1,1])
Screen('Flip', 10, 0, 1)
Screen('DrawText', 10, double(output), 580, 540, [0,0,0], [1,1,1])
Screen('Flip', 10, 0, 1)
Screen('DrawText', 10, double(output), 600, 540, [0,0,0], [1,1,1])
Screen('Flip', 10, 0, 1)
x = 630;
bgColor = [1,1,1];
78
EmReg_task
7
8
4
3
4
5
6
7
sca
EmReg_task
```

```
6
4
6
3
2
5
6
3
4
5
6
3
4
5
6
sca
EmReg_task
Screen('DrawTexture', window, scale, [], [xCenter (yCenter+(yCenter/3))], 0); %change↙
location to bottom
EmReg_task
%-- 2/9/22, 12:01 PM --%
cd /Users/dianaperez/Desktop/Mentoring/
%-- 2/9/22, 1:55 PM --%
network_seg_new
help sprintf
network_seg_new
%-- 2/10/22, 10:20 AM --%
EmReg_task
sca
%-- 2/10/22, 11:08 AM --%
EmReg_task
Condition = conditions(Condition,:);
sca
EmReg_task
%-- 2/10/22, 1:22 PM --%
EmReg_task
7
4
3
4
5
6
4
3
2
4
5
5
4
-2
5
4
sca
yCenter-(yCenter/3)
yCenter-(yCenter/2)
yCenter-(yCenter/8)
yCenter-(yCenter/4)
yCenter-(yCenter*(3/4))
EmReg_task
sca
```

```
EmReg_task
sca
EmReg_task
sca
EmReg_task
7
4
4
4
4
4
5
5
5
5
5
5
5
-3
5
sca
EmReg_task
7
7
7
7
7
7
7
7
7
7
7
7
7
7
7
numel(emotions_table)
length(emotions_table)
EmReg_task
5
5
5
5
5
5
5
5
5
5
5
5
5
5
5
EmReg_task
5
3
4
3
```

```
5
3
2
5
6
3
4
5
-2
3
EmReg_task
5
4
5
3
2
5
6
4
2
3
2
3
4
-2
3
[droppedframes] = Screen('PlayMovie', [clips_dir clips{conditions(1)}], 1);
EmReg_task
4
4
4
4
4
4
4
4
4
4
4
4
4
4
4
[clips_dir clips{conditions(1)}]
EmReg_task
4
4
4
4
4
4
4
4
4
4
4
4
4
4
4
```

```
EmReg_task
3
3
3
3
3
3
3
3
3
3
3
3
3
3
3
%-- 2/10/22, 1:47 PM --%
Pscyhtoolbox/PsychDemos/MovieDemo.m
Psychtoolbox/PsychDemos/MovieDemo.m
cd /Users/dianaperez/Documents/MATLAB/
MovieDemo
sca
%-- 2/10/22, 2:14 PM --%
LoadMovieIntoTexturesDemo('/Volumes/RESEARCH_HD/LifespanProjectTasks/EmoReg/clips/Champ.↙
mp4')
ShowCursor;
%-- 2/10/22, 3:10 PM --%
LoadMovieIntoTexturesDemo('/Volumes/RESEARCH_HD/LifespanProjectTasks/EmoReg/clips/Champ.↙
mp4')
ShowCursor;
%-- 2/10/22, 3:33 PM --%
pathtool
cd ~/Downloads
DownloadPsychtoolbox
%-- 2/10/22, 3:41 PM --%
EmReg_task
6
6
6
6
6
6
6
6
6
6
sca
EmReg_task
5
5
5
5
5
5
5
5
5
5
5
5
```

```
5
5
5
5
4
4
4
4
4
4
4
4
4
4
4
4
4
4
4
EmReg_task
sca
EmReg_task
Screen('Flip', window);
Screen('PlayMovie', moviePtr, 1);
Screen('Flip', window);
Screen('PlayMovie', moviePtr, 1);
[moviePtr] = Screen('OpenMovie', window, [clips_dir clips{conditions(1)}]);
Screen('PlayMovie', moviePtr, 1);
sca
EmReg_task
[moviePtr] = Screen('OpenMovie', window, [clips_dir clips{conditions(1)}]);
Screen('Flip', window);
[moviePtr] = Screen('OpenMovie', window, [clips_dir clips{conditions(1)}]);
[clips_dir clips{conditions(1)}]
[moviePtr] = Screen('OpenMovie', window,↙
'/Volumes/RESEARCH_HD/LifespanProjectTasks/EmoReg/clips/21Grams_converted.mov');
Screen('PlayMovie', moviePtr, 1)
Screen('PlayMovie',↙
'/Volumes/RESEARCH_HD/LifespanProjectTasks/EmoReg/clips/21Grams_converted.mov', 1)
Screen('CloseAll')
sca
EmReg_task
help tic
toc
tic
toc
sca
EmReg_task
sca
EmReg_task
5
5
5
5
5
5
5
5
5
5
```

```
5
5
5
5
5
5
5
sca
EmReg_task
sca
EmReg_task
5
5
5
5
5
5
5
5
5
5
5
5
5
5
5
sca
KbName('spaceBar')
KbName('space')
KbName('leftarrow')
KbName('q')
Condition = 0;
conditions(Condition)
EmReg_task
sca
EmReg_task
sca
EmReg_task
4
4
4
4
4
4
4
4
4
4
4
4
4
4
EmReg_task
6
6
6
6
6
6
6
```

```
6
6
6
6
6
6
6
6
EmReg_task
4
4
4
EmReg_task
4
3
2
1
2
1
2
3
4
5
6
7
1
2
3
4
5
6
7
6
1
1
1
1
1
1
1
1
1
1
EmReg_task
2
sca
EmReg_task
1
1
sca
EmReg_task
n 5
5
5
5
5
5
6
6
6
```

```
6
6
6
7
6
6
q   3
3
3
5
7
64
6
6
6
6
7
7
7
6
5
q   2
3
23
5
4
5
6
7
6
7
6
5
6
7
5
7
76
EmReg_task
2
3
4
5
6
5
4
3
4
5
6
sca
%-- 3/5/22, 3:24 PM --%
EmReg_task
%-- 3/5/22, 3:30 PM --%
EmReg_task
help strfind
sca
EmReg_task
addpath '/Volumes/RESEARCH_HD/LifespanProjectTasks/EmoReg'
EmReg_task
```

```
sca
EmReg_task
7
EmReg_task
7
5
EmReg_task
7
7
7
Screen('Flip', window);
7
help DrawFormattedText
help Screen
EmReg_task
7
EmReg_task
7
EmReg_task
%-- 3/8/22, 10:53 AM --%
net_size_asymmetry
addpath(genpath('/Volumes/Back_Up/Box/Dependencies/cifti-matlab-master/'))
net_size_asymmetry
print(gcf,[output_dir 'HCP384_indiv_nets_asymm_surfArea.jpg'],'-dpng','-r300');
%-- 3/8/22, 2:38 PM --%
net_size_asymmetry
scatter(8,avg_diff(1,6), 'MarkerEdgeColor', 'w', 'MarkerFaceColor', 'w', 'SizeData', 50)
load↙
('/Users/dianaperez/Desktop/Research/lateralization_code/testing_output/HCP384_new_split_↙
networksxHem.mat')
diff_numvars_all =[];
asymm_numvars_all = [];
diff_sizenets_all = [];
net_size_asymmetry
length(networksxHem.verticesLH(net))
size(networksxHem.verticesLH(net))
size(networksxHem.verticesLH)
length(networksxHem.verticesLH)
net_size_asymmetry
diff_numvars(s)
max([networksxHem.verticesLH(s,net), networksxHem.verticesRH(s,net)]
max([networksxHem.verticesLH(s,net), networksxHem.verticesRH(s,net)])
networksxHem.verticesLH(s,net)
networksxHem.verticesRH(s,net)
net_size_asymmetry
diff_numvars_all = asymm_numvars_all;
[r p] = corr(diff_numvars_all, diff_sizenets_all)
rvals(17) = r;
pvals(17) = p;
scatter(diff_numvars_all, diff_sizenets_all)
hold on
p = polyfit(diff_numvars_all, diff_sizenets_all,1);
px = [min(diff_numvars_all) max(diff_numvars_all)];
py = polyval(p, px);
plot(px, py, 'LineWidth', 2);
title('All networks');
xlabel('Number of Variant Vertices (right hem)');
ylabel('Network Surface Area in mm^2 (right hem)');
nonzero_numvars = diff_numvars_all(diff_numvars_all~=0);
find(nonzero_numvars==0)
```

```
nonzero_sizenets = diff_sizenets_all(diff_sizenets_all~=0);
[r p] = corr(nonzero_numvars, nonzero_sizenets)
rvals(17) = r;
pvals(17) = p;
nonzero_numvars = find(diff_numvars_all~=0);
diff_sizenets_all=diff_sizenets_all(nonzero_numvars);
diff_numvars_all=diff_numvars_all(nonzero_numvars);
find(diff_sizenets_all==0)
find(diff_numvars_all==0)
[r p] = corr(diff_numvars_all, diff_sizenets_all)
rvals(17) = r;
pvals(17) = p;
scatter(diff_numvars_all, diff_sizenets_all)
hold on
p = polyfit(diff_numvars_all, diff_sizenets_all,1);
px = [min(diff_numvars_all) max(diff_numvars_all)];
py = polyval(p, px);
plot(px, py, 'LineWidth', 2);
title('All networks');
xlabel('Number of Variant Vertices (right hem)');
ylabel('Network Surface Area in mm^2 (right hem)');
net_size_asymmetry
help mean
averages = mean(asymm_numvars_all,2);
averages = mean(asymm_numvars_all,1);
names =↙
{'DMN','Vis','FP','DAN','VAN','Sal','CO','SMd','SMl','Aud','Tpole','MTL','PMN','PON'};
rgb = [1 0 0; %DMN
0 0 .6; %Vis
1 1 0; %FP
% .67 .67 .67; %Unassigned
0 .8 0; %DAN
%   .67 .67 .67; %Unassigned2
0 .6 .6;%VAN
0 0 0; % Sal
.3 0 .6; %CON
.2 1 1; %SMd
1 .5 0; % SMl
.6 .2 1; %Aud
.2 1 .2; %Tpole
0 .2 .4; %MTL
0 0 1; %PMN
.8 .8 .6]; %PON
for n = 1:numel(names)
rgb_for_plot{n} = rgb(n,:);
end
to_plot = averages;
to_plot = asymm_numvars_all;
to_plot(385,:) = averages;
ind = zeros(385,1);
ind(385) = 1;
net_inds = [ind ind ind ind ind ind ind ind ind ind ind ind ind ind];
handles = plotSpread(to_plot, 'categoryMarkers', {'x', '.'}, 'categoryLabels',↙
{'Indiv_asymm_scores','Average'}, 'distributionColors', rgb_for_plot', 'categoryIdx',↙
net_inds, 'xNames', names)
for n = 1:numel(names)
rgb_for_plot{n} = rgb(n,:);
end
names =↙
{'DMN','Vis','FP','DAN','VAN','Sal','CO','SMd','SMl','Aud','Tpole','MTL','PMN','PON'};
```

```
for n = 1:numel(names)
rgb_for_plot{n} = rgb(n,:);
end
clear rgb_for_plot
for n = 1:numel(names)
rgb_for_plot{n} = rgb(n,:);
end
handles = plotSpread(to_plot, 'categoryMarkers', {'x', '.'}, 'categoryLabels',↙
{'Indiv_asymm_scores','Average'}, 'distributionColors', rgb_for_plot', 'categoryIdx',↙
net_inds, 'xNames', names)
close gcf
hist(asym_numvars_all(:,1))
hist(asymm_numvars_all(:,1))
right_lateralized_DMN = find(asymm_numvars_all(:,1)<0);
figure;
net_size_asymmetry
hist(asymm_numvars_all(:,1))
right_lateralized_DMN = find(asymm_numvars_all(:,1)<0);
figure;
scatter(asymm_numvars_all(right_lateralized_DMN,1), diff_sizenets_all↙
(right_lateralized_DMN,1))
left_lateralized_DMN = find(asymm_numvars_all(:,1)>0);
figure;
scatter(asymm_numvars_all(left_lateralized_DMN,1), diff_sizenets_all↙
(left_lateralized_DMN,1))
right_lateralized_DMN = find(diff_sizenets_all(:,1)<0);
figure;
scatter(asymm_numvars_all(right_lateralized_DMN,1), diff_sizenets_all↙
(right_lateralized_DMN,1))
left_lateralized_DMN = find(diff_sizenets_all(:,1)>0);
figure;
scatter(asymm_numvars_all(left_lateralized_DMN,1), diff_sizenets_all↙
(left_lateralized_DMN,1))
hist(asymm_numvars_all(:,1))
right_lateralized_DMN = find(asymm_numvars_all(:,1)<0);
mean(diff_sizenets_all(right_lateralized_DMN,1))
left_lateralized_DMN = find(asymm_numvars_all(:,1)>0);
mean(diff_sizenets_all(left_lateralized_DMN,1))
high_asymmetry_clusters
cd '/Users/dianaperez/Documents/GitHub/PerezEtAl_HemAsymmetries'
high_asymmetry_clusters
rgb = [1 0 0; %DMN
0 0 .6; %Vis
1 1 0; %FP
%.67 .67 .67; %Unassigned
0 .8 0; %DAN
%.67 .67 .67; %Unassigned2
0 .6 .6;%VAN
0 0 0; % Sal
.3 0 .6; %CON
.2 1 1; %SMd
1 .5 0; % SMl
.6 .2 1; %Aud
.2 1 .2; %Tpole
0 .2 .4; %MTL
0 0 1; %PMN
.8 .8 .6]; %PON
network_names =↙
{'DMN','Vis','FP','DAN','VAN','Sal','CO','SMd','SMl','Aud','Tpole','MTL','PMN','PON'};
good_nets_LH = [clusterA.left_hem.number(:,1:3) clusterA.left_hem.number(:,5) clusterA.↙
```

```
left_hem.number(:,7:end)];
good_nets_RH = [clusterA.right_hem.number(:,1:3) clusterA.right_hem.number(:,5) clusterA.↙
right_hem.number(:,7:end)];
sum_good_nets = sum(good_nets_LH,1);
sum_good_nets_RH = sum(good_nets_RH,1);
for net = 1:numel(network_names)
asymm(net) = (sum_good_nets(net) - sum_good_nets_RH(net))/max([sum_good_nets(net),↙
sum_good_nets_RH(net)]);
end
plot(asymm)
scatter(asymm)
scatter(sum_good_nets,sum_good_nets_RH, 80, rgb_colors, 'filled')
scatter(sum_good_nets,sum_good_nets_RH, 80, rgb, 'filled')
line = refline(1,0);
line.Color = 'black';
sum_variants = sum_good_nets + sum_good_nets_RH;
sum_good_nets/sum_variants
sum_good_nets./sum_variants
scatter((sum_good_nets./sum_variants),(sum_good_nets_RH./sum_variants), 80, rgb,↙
'filled')
close gcf
scatter((sum_good_nets./sum_variants),(sum_good_nets_RH./sum_variants), 80, rgb,↙
'filled')
(sum_good_nets./sum_variants)
(sum_good_nets_RH./sum_variants)
prop_vars_LH = ~isnan(sum_good_nets./sum_variants)
prop_vars_LH = sum_good_nets./sum_variants;
prop_vars_LH = prop_vars_LH(~isnan(prop_vars_LH)
prop_vars_LH = prop_vars_LH(~isnan(prop_vars_LH))
prop_vars_RH = sum_good_nets_RH./sum_variants;
prop_vars_RH = prop_vars_RH(~isnan(prop_vars_RH))
scatter(prop_vars_LH,prop_vars_RH, 80, rgb, 'filled')
rgb = rgb(~isnan(sum_good_nets_RH./sum_variants),:);
scatter(prop_vars_LH,prop_vars_RH, 80, rgb, 'filled')
close gcf
scatter(prop_vars_LH,prop_vars_RH, 80, rgb, 'filled')
ax_max = max([x;y])+(std([x;y]/2))
axis([0 ax_max 0 ax_max]);
line = refline(1,0);
line.Color = 'black';
xlabel('Left Hemisphere')
ylabel('Right Hemisphere')
ax = gca;
ax.FontSize = 24;
line = refline(1,0);
line.Color = 'black';
xlabel('Left Hemisphere')
ylabel('Right Hemisphere')
ax = gca;
ax.FontSize = 24;
load↙
('/Users/dianaperez/Desktop/Research/lateralization_code/testing_output/HCP384_variants_i↙
nfo.mat')
clear all
load↙
('/Users/dianaperez/Desktop/Research/lateralization_code/testing_output/HCP384_variants_i↙
nfo.mat')
numVars = variants_info.left_hem.group_avg{:,1};
numVars_LH = numVars;
numVars_RH = variants_info.right_hem.group_avg{:,1};
```

```
diff_numVars = numVars_LH - numVars_RH;
for s = 1:384
asymm_numVars(s,1) = diff_numVars(s)/max([numVars_LH(s), numVars_RH(s)]);
end
mean(asymm_numVars)
plot(asymm_numVars)
scatter(asymm_numVars)
hist(asymm_numVars)
close gcf
numVerts = variants_info.left_hem.group_avg{:,2};
numVerts_LH = variants_info.left_hem.group_avg{:,2};
numVerts_RH = variants_info.right_hem.group_avg{:,2};
diff_numVars = numVerts_LH - numVerts_RH;
for s = 1:384
asymm_numVerts(s,1) = diff_numVerts(s)/max([numVerts_LH(s), numVerts_RH(s)]);
end
diff_numVerts = numVerts_LH - numVerts_RH;
for s = 1:384
asymm_numVerts(s,1) = diff_numVerts(s)/max([numVerts_LH(s), numVerts_RH(s)]);
end
mean(asymm_numVerts)
avg_surf_LH = variants_info.left_hem.group_avg{:,4};
avg_surf_RH = variants_info.right_hem.group_avg{:,4};
diff_avgSurf = avg_surf_LH - avg_surf_RH;
for s = 1:384
asymm_avg_surf(s,1) = diff_avgSurf(s)/max([avg_surf_LH(s), avg_surf_RH(s)]);
end
mean(asymm_avg_surf)
load↙
('/Users/dianaperez/Desktop/Research/lateralization_code/testing_output/HCP384_networksxH↙
em.mat')
clear all
load↙
('/Users/dianaperez/Desktop/Research/lateralization_code/testing_output/HCP384_networksxH↙
em.mat')
diff_clusters = networksxHem.clustersLH - networksxHem.clustersRH;
for net = 1:16
for s = 1:384
asymm_net(s,net) = diff_clusters(s,net)/max([networksxHem.clustersLH(s,net),↙
networksxHem.clustersRH(s,net)]);
end
end
mean(asymm_net,1)
for net = 1:16
for s = 1:384
asymm_net(s,net) = diff_clusters(s,net)/max([networksxHem.clustersLH(s,net),↙
networksxHem.clustersRH(s,net)]);
if isnan(asymm_net(s,net))
asymm_net(s,net) = 0;
end
end
end
mean(asymm_net,1)
bar(asymm)
bar(ans)
load↙
('/Users/dianaperez/Desktop/Research/lateralization_code/testing_output/network_symmetry/↙
WashU120_network_sizes_across_hems.mat')
clear all
load↙
```

```
('/Users/dianaperez/Desktop/Research/lateralization_code/testing_output/network_symmetry/↙
WashU120_network_sizes_across_hems.mat')
diff_surf = net_size(:,3) - net_size(:,7);
for net = 1:16
asymm(net) = diff_surf/max([net_size(net,3), net_size(net,7)]);
if isnan(asymm(net))
asymm(net) = 0;
end
end
for net = 1:16
asymm(net) = diff_surf/max([net_size(net,3), net_size(net,7)]);
asymm(net) = diff_surf(net)/max([net_size(net,3), net_size(net,7)]);
end
for net = 1:16
asymm(net) = diff_surf(net)/max([net_size(net,3), net_size(net,7)]);
if isnan(asymm(net))
asymm(net) = 0;
end
end
rgb = [1 0 0; %DMN
0 0 .6; %Vis
1 1 0; %FP
%.67 .67 .67; %Unassigned
0 .8 0; %DAN
% .67 .67 .67; %Unassigned2
0 .6 .6;%VAN
0 0 0; % Sal
.3 0 .6; %CON
.2 1 1; %SMd
1 .5 0; % SMl
.6 .2 1; %Aud
.2 1 .2; %Tpole
0 .2 .4; %MTL
0 0 1; %PMN
.8 .8 .6]; %PON
asymm(4) = [];
asymm(5) = [];
for net = 1:14
bar_series(net) = bar(asymm(net), 'BarWidth', 0.9);
set(bar_series(net), 'FaceColor', rgb(net,:));
hold on;
end
close gcf
count = 1;
for net = 1:14
bar_series(net) = bar(count, asymm(net), 'BarWidth', 0.9);
set(bar_series(net), 'FaceColor', rgb(net,:));
count = count + 1;
hold on;
end
network_names =↙
{'DMN','Vis','FP','DAN','VAN','Sal','CO','SMd','SMl','Aud','Tpole','MTL','PMN','PON'};
xticklabels(network_names)
clear all
load↙
('/Users/dianaperez/Desktop/Research/lateralization_code/testing_output/HCP384_networksxH↙
em.mat')
diff_numvars = networksxHem.clustersLH - networksxHem.clustersRH;
for net = 1:16
average_diff(net) = mean(diff_numvars(:,net));
```

```
asymm_netvars(net) = average_diff/max([mean(networksxHem.clustersLH(:,net)), mean↙
(networksxHem.clustersRH(:,net))]);
if isnan(asymm_netvars(net))
asymm_netvars(net) = 0;
end
end
for net = 1:16
average_diff(net) = mean(diff_numvars(:,net));
asymm_netvars(net) = average_diff(net)/max([mean(networksxHem.clustersLH(:,net)), mean↙
(networksxHem.clustersRH(:,net))]);
if isnan(asymm_netvars(net))
asymm_netvars(net) = 0;
end
end
for net = 1:16
for s = 1:384
asymm_netvars_ind(s,net) = (networksxHem.clustersLH(s,net)-networksxHem.clustersRH(s,↙
net))/max([networksxHem.clustersLH(:,net), networksxHem.clustersRH(:,net)]);
end
end
for net = 1:16
for s = 1:384
asymm_netvars_ind(s,net) = (networksxHem.clustersLH(s,net)-networksxHem.clustersRH(s,↙
net))/max([networksxHem.clustersLH(s,net), networksxHem.clustersRH(s,net)]);
if isnan(asymm_netvars_ind(s,net))
asymm_netvars_ind(s,net) = 0;
end
end
end
mean(asymm_netvars_ind,1)
count = 1;
avg_asymm = ans;
avg_asymm(6) = [];
avg_asymm(4) = [];
for net = 1:14
bar_series(net) = bar(count, avg_asymm(net), 'BarWidth', 0.9);
set(bar_series(net), 'FaceColor', rgb(net,:));
count = count + 1;
hold on;
end
rgb = [1 0 0; %DMN
0 0 .6; %Vis
1 1 0; %FP
%.67 .67 .67; %Unassigned
0 .8 0; %DAN
% .67 .67 .67; %Unassigned2
0 .6 .6;%VAN
0 0 0; % Sal
.3 0 .6; %CON
.2 1 1; %SMd
1 .5 0; % SMl
.6 .2 1; %Aud
.2 1 .2; %Tpole
0 .2 .4; %MTL
0 0 1; %PMN
.8 .8 .6]; %PON
count = 1;
for net = 1:14
bar_series(net) = bar(count, avg_asymm(net), 'BarWidth', 0.9);
set(bar_series(net), 'FaceColor', rgb(net,:));
```

```
count = count + 1;
hold on;
end
close gcf
count = 1;
for net = 1:14
bar_series(net) = bar(count, avg_asymm(net), 'BarWidth', 0.9);
set(bar_series(net), 'FaceColor', rgb(net,:));
count = count + 1;
hold on;
end
close gcf
net_size_asymmetry
axis([1 1 1.25 1.25])
axis([1, 1, 1.25, 1.25,])
axis([-1, 1, -1.25, 1.25,])
p = polyfit(diff_numvars_all, diff_sizenets_all,1);
px = [min(diff_numvars_all) max(diff_numvars_all)];
py = polyval(p, px);
plot(px, py, 'b', 'LineWidth', 2);
plot(px, py, 'k', 'LineWidth', 2);
axis([-1.25, 1.25,-1,1])
axis([-1, 1, -1.25, 1.25,])
net_size_asymmetry
axis([-1, 1, -1.25, 1.25,])
p = polyfit(diff_numvars_all, diff_sizenets_all,1);
px = [min(diff_numvars_all) max(diff_numvars_all)];
py = polyval(p, px);
plot(px, py, 'k','LineWidth', 2);
axis([-1, 1, -1, 1])
[p_fdr, p_masked] = FDR(pvals, 0.025)
permute_net_assignment
[true_diff perm_diffs] = network_comparisons(LH_info.networksxHem.clustersLH(:,3),↙
LHand_info.networksxHem.clustersRH(:,3), flip_switch, numperms, 0, 1, net);
permute_net_assignment
[p_fdr p_masked] = FDR(p_vals, .025);
permute_net_assignment
flip_switch = zeros(670,1);
flip_switch(1:floor(670/2)) = 1;
[p_fdr p_masked] = FDR(p_vals, .025);
clear all
net_size_across_hems
net_size_asymmetry
help dicomhdr
help dicominfo
%-- 3/13/22, 3:28 PM --%
net_size_across_hems
load↙
('/Users/dianaperez/Desktop/Research/lateralization_code/testing_output/HCP384_new_split_↙
variants_info.mat')
load↙
('/Users/dianaperez/Desktop/Research/lateralization_code/testing_output/HCP384_networksxH↙
em.mat')
lh_numvars = mean(networksxHem.clustersLH,1);
rh_numvars = mean(networksxHem.clustersRH,1);
scatter(lh_numvars, rh_numvars, 80, rgb_colors, 'filled')
scatter(lh_numvars, rh_numvars, 80, 'k')
axis([0 2.5 0 2.5])
line = refline(1,0);
line.Color = 'black';
```

```
xlabel('Left Hemisphere')
ax = gca;
ax.FontSize = 24;
for net = 1:16
se_lh(net) = std(networksxHem.clustersLH(:,net))/sqrt(384);
se_rh(net) = std(networksxHem.clustersRH(:,net))/sqrt(384);
end
errorbar(lh_numvars, rh_numvars, se_rh, se_rh, se_lh, se_lh, 'o')
rgb_colors = [1 0 0; %DMN
0 0 .6; %Vis
1 1 0; %FP
.67 .67 .67; %Unassigned
0 .8 0; %DAN
.67 .67 .67; %Unassigned2
0 .6 .6;%VAN
0 0 0; % Sal
.3 0 .6; %CON
.2 1 1; %SMd
1 .5 0; % SMl
.6 .2 1; %Aud
.2 1 .2; %Tpole
0 .2 .4; %MTL
0 0 1; %PMN
.8 .8 .6]; %PON
scatter(lh_numvars, rh_numvars, 80, rgb_colors, 'filled')
scatter(lh_numvars, rh_numvars, 80, 'k')
axis([0 2.5 0 2.5])
line = refline(1,0);
line.Color = 'black';
xlabel('Left Hemisphere')
ax = gca;
ax.FontSize = 24;
for net = 1:16
se_lh(net) = std(networksxHem.clustersLH(:,net))/sqrt(384);
se_rh(net) = std(networksxHem.clustersRH(:,net))/sqrt(384);
end
errorbar(lh_numvars, rh_numvars, se_rh, se_rh, se_lh, se_lh, 'o')
close gcf
scatter(lh_numvars, rh_numvars, 80, rgb_colors, 'filled')
hold on
scatter(lh_numvars, rh_numvars, 80, 'k')
axis([0 2.5 0 2.5])
line = refline(1,0);
line.Color = 'black';
xlabel('Left Hemisphere')
ax = gca;
ax.FontSize = 24;
for net = 1:16
se_lh(net) = std(networksxHem.clustersLH(:,net))/sqrt(384);
se_rh(net) = std(networksxHem.clustersRH(:,net))/sqrt(384);
end
errorbar(lh_numvars, rh_numvars, se_rh, se_rh, se_lh, se_lh, 'o')
errorbar.Color
errorbar.Colors
close gcf
scatter(lh_numvars, rh_numvars, 80, rgb_colors, 'filled')
hold on
scatter(lh_numvars, rh_numvars, 80, 'k')
axis([0 2.5 0 2.5])
line = refline(1,0);
```

```
line.Color = 'black';
xlabel('Left Hemisphere')
ax = gca;
ax.FontSize = 24;
for net = 1:16
se_lh(net) = std(networksxHem.clustersLH(:,net))/sqrt(384);
se_rh(net) = std(networksxHem.clustersRH(:,net))/sqrt(384);
end
h = errorbar(lh_numvars, rh_numvars, se_rh, se_rh, se_lh, se_lh, 'o')
close gcf
scatter(lh_numvars, rh_numvars, 80, rgb_colors, 'filled')
hold on
scatter(lh_numvars, rh_numvars, 80, 'k')
axis([0 2.5 0 2.5])
line = refline(1,0);
line.Color = 'black';
xlabel('Left Hemisphere')
ax = gca;
ax.FontSize = 24;
for net = 1:16
se_lh(net) = std(networksxHem.clustersLH(:,net))/sqrt(384);
se_rh(net) = std(networksxHem.clustersRH(:,net))/sqrt(384);
end
h = errorbar(lh_numvars, rh_numvars, se_rh, se_rh, se_lh, se_lh, 'o')
h.Color = [0,0,0];
scatter(lh_numvars, rh_numvars, 80, rgb_colors, 'filled')
scatter(lh_numvars, rh_numvars, 80, 'k')
print(gcf,↙
'/Users/dianaperez/Desktop/Research/lateralization_code/HCP384_numvars_scatterplot.jpg',↙
'-dpng', '-r300')
%-- 3/13/22, 8:17 PM --%
net_size_asymmetry
addpath↙
'/Users/dianaperez/Documents/GitHub/PerezEtAl_HemAsymmetries/needed_files/plotSpread/plot↙
Spread'
net_size_asymmetry
mean(asymm_numvars_all,1)
mean(diff_sizenets_all,1)
permute_net_assignment
addpath '/Users/dianaperez/Documents/GitHub/PerezEtAl_HemAsymmetries/needed_files'
permute_net_assignment
network_names =↙
{'DMN','Vis','FP','DAN','Lang,'Sal','CO','SMd','SMl','Aud','Tpole','MTL','PMN','PON'};
rgb_colors = [1 0 0; %DMN
0 0 .6; %Vis
1 1 0; %FP
0 .8 0; %DAN
0 .6 .6;%VAN
0 0 0; % Sal
.3 0 .6; %CON
.2 1 1; %SMd
1 .5 0; % SMl
.6 .2 1; %Aud
.2 1 .2; %Tpole
0 .2 .4; %MTL
0 0 1; %PMN
.8 .8 .6]; %PON
good_nets = [output_mat(:,1:3) output_mat(:,5) output_mat(:,7:end)];
rgb_for_plot = {};
for n = 1:numel(network_names)
```

```
rgb_for_plot{n} = rgb_colors(n,:);
end
ind = zeros(numperms+1,1);
ind(1,1) = 1;
net_inds = [ind ind ind ind ind ind ind ind ind ind ind ind ind ind];
handles = plotSpread(good_nets, 'categoryMarkers', {'x', '.'}, 'categoryLabels',↙
{'Permuted Differences','True Difference'}, 'distributionColors', rgb_for_plot',↙
'categoryIdx', net_inds, 'xNames', network_names)
ax = gca;
ax.FontSize = 24;
scatter([1:14],good_nets(1,:), 'MarkerEdgeColor', 'k', 'MarkerFaceColor', 'k',↙
'SizeData', 50)
scatter(6,good_nets(1,6), 'MarkerEdgeColor', 'w', 'MarkerFaceColor', 'w', 'SizeData', 50)
ylabel('Difference in Number of Variants')
xlabel('Assigned Network')
min_ax = min(min(good_nets(:,:)))-(min(std(good_nets)/2));
max_ax = max(max(good_nets(:,:)))+(min(std(good_nets)/2));
axis([0, 15, min_ax, max_ax])
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.9, 0.7]);
print(gcf,[output_dir out_str '_PermutationTesting_networkAssignment.jpg'],'-dpng','-↙
r300');
network_names =↙
{'DMN','Vis','FP','DAN','Lang','Sal','CO','SMd','SMl','Aud','Tpole','MTL','PMN','PON'};
rgb_colors = [1 0 0; %DMN
0 0 .6; %Vis
1 1 0; %FP
0 .8 0; %DAN
0 .6 .6;%VAN
0 0 0; % Sal
.3 0 .6; %CON
.2 1 1; %SMd
1 .5 0; % SMl
.6 .2 1; %Aud
.2 1 .2; %Tpole
0 .2 .4; %MTL
0 0 1; %PMN
.8 .8 .6]; %PON
good_nets = [output_mat(:,1:3) output_mat(:,5) output_mat(:,7:end)];
rgb_for_plot = {};
for n = 1:numel(network_names)
rgb_for_plot{n} = rgb_colors(n,:);
end
ind = zeros(numperms+1,1);
ind(1,1) = 1;
net_inds = [ind ind ind ind ind ind ind ind ind ind ind ind ind ind];
handles = plotSpread(good_nets, 'categoryMarkers', {'x', '.'}, 'categoryLabels',↙
{'Permuted Differences','True Difference'}, 'distributionColors', rgb_for_plot',↙
'categoryIdx', net_inds, 'xNames', network_names)
ax = gca;
ax.FontSize = 24;
scatter([1:14],good_nets(1,:), 'MarkerEdgeColor', 'k', 'MarkerFaceColor', 'k',↙
'SizeData', 50)
scatter(6,good_nets(1,6), 'MarkerEdgeColor', 'w', 'MarkerFaceColor', 'w', 'SizeData', 50)
ylabel('Difference in Number of Variants')
xlabel('Assigned Network')
min_ax = min(min(good_nets(:,:)))-(min(std(good_nets)/2));
max_ax = max(max(good_nets(:,:)))+(min(std(good_nets)/2));
axis([0, 15, min_ax, max_ax])
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.9, 0.7]);
print(gcf,[output_dir out_str '_PermutationTesting_networkAssignment.jpg'],'-dpng','-↙
```

```
r300');
permute_net_assignment
var_freq_size_net
addpath '/Users/dianaperez/Documents/GitHub/PerezEtAl_HemAsymmetries'
var_freq_size_net
%-- 3/15/22, 1:24 PM --%
net_size_across_hems
root_dir = '/Users/dianaperez/Desktop/Research/lateralization_code/'; % location of code↙
directory
%root_dir = '/projects/p31161/lateralization_code/';
data_location = [root_dir 'testing_output/'];
LHand_info = load([data_location 'HCP752_LH_networksxHem.mat']);
RHand_info = load([data_location 'HCP752_RH_networksxHem.mat']);
clear all
root_dir = '/Users/dianaperez/Desktop/Research/lateralization_code/'; % location of code↙
directory
%root_dir = '/projects/p31161/lateralization_code/';
data_location = [root_dir 'testing_output/'];
LHand_info = load([data_location 'HCP752_LH_networksxHem.mat']);
RHand_info = load([data_location 'HCP752_RH_networksxHem.mat']);
lh_numvars = mean(LHand_info.networksxHem.clustersLH,1);
rh_numvars = mean(LHand_info.networksxHem.clustersRH,1);
rgb_colors = [1 0 0; %DMN
0 0 .6; %Vis
1 1 0; %FP
.67 .67 .67; %Unassigned
0 .8 0; %DAN
.67 .67 .67; %Unassigned2
0 .6 .6;%VAN
0 0 0; % Sal
.3 0 .6; %CON
.2 1 1; %SMd
1 .5 0; % SMl
.6 .2 1; %Aud
.2 1 .2; %Tpole
0 .2 .4; %MTL
0 0 1; %PMN
.8 .8 .6]; %PON
scatter(lh_numvars, rh_numvars, 80, rgb_colors, 'filled')
hold on
scatter(lh_numvars, rh_numvars, 80, 'k')
lh_numvars = mean(RHand_info.networksxHem.clustersLH,1);
rh_numvars = mean(RHand_info.networksxHem.clustersRH,1);
scatter(lh_numvars, rh_numvars, 80, rgb_colors, 'd', 'filled')
hold on
scatter(lh_numvars, rh_numvars, 80, 'd','k')
line = refline(1,0);
line.Color = 'black';
xlabel('Left Hemisphere')
ax = gca;
ax.FontSize = 24;
ylabel('Right Hemisphere')
close gcf
% load data
root_dir = '/Users/dianaperez/Desktop/Research/lateralization_code/'; % location of code↙
directory
data_location = [root_dir 'testing_output/'];
LHand_info = load([data_location 'HCP752_LH_networksxHem.mat']);
RHand_info = load([data_location 'HCP752_RH_networksxHem.mat']);
%plot left-handers
```

```
lh_numvars = mean(LHand_info.networksxHem.clustersLH,1);
rh_numvars = mean(LHand_info.networksxHem.clustersRH,1);
scatter(lh_numvars, rh_numvars, 80, rgb_colors, 'filled')
hold on
scatter(lh_numvars, rh_numvars, 80, 'k')
for net = 1:16
se_lh(net) = std(LHand_info.networksxHem.clustersLH(:,net))/sqrt(40);
se_rh(net) = std(LHand_info.networksxHem.clustersRH(:,net))/sqrt(40);
end
h = errorbar(lh_numvars, rh_numvars, se_rh, se_rh, se_lh, se_lh, 'o')
h.Color = [0,0,0];
% plot right-handers
lh_numvars = mean(RHand_info.networksxHem.clustersLH,1);
rh_numvars = mean(RHand_info.networksxHem.clustersRH,1);
scatter(lh_numvars, rh_numvars, 80, rgb_colors, 'd', 'filled')
hold on
scatter(lh_numvars, rh_numvars, 80, 'd','k')
axis([0 2.5 0 2.5])
line = refline(1,0);
line.Color = 'black';
xlabel('Left Hemisphere')
ylabel('Right Hemisphere')
ax = gca;
ax.FontSize = 24;
for net = 1:16
se_lh(net) = std(RHand_info.networksxHem.clustersLH(:,net))/sqrt(670);
se_rh(net) = std(RHand_info.networksxHem.clustersRH(:,net))/sqrt(670);
end
h = errorbar(lh_numvars, rh_numvars, se_rh, se_rh, se_lh, se_lh, 'o')
h.Color = [0,0,0];
close gcf
root_dir = '/Users/dianaperez/Desktop/Research/lateralization_code/'; % location of code↙
directory
data_location = [root_dir 'testing_output/'];
LHand_info = load([data_location 'HCP752_LH_networksxHem.mat']);
RHand_info = load([data_location 'HCP752_RH_networksxHem.mat']);
%plot left-handers
lh_numvars = mean(LHand_info.networksxHem.clustersLH,1);
rh_numvars = mean(LHand_info.networksxHem.clustersRH,1);
for net = 1:16
se_lh(net) = std(LHand_info.networksxHem.clustersLH(:,net))/sqrt(40);
se_rh(net) = std(LHand_info.networksxHem.clustersRH(:,net))/sqrt(40);
end
h = errorbar(lh_numvars, rh_numvars, se_rh, se_rh, se_lh, se_lh, 'o')
h.Color = [0,0,0];
scatter(lh_numvars, rh_numvars, 80, rgb_colors, 'filled')
hold on
scatter(lh_numvars, rh_numvars, 80, 'k')
% plot right-handers
lh_numvars = mean(RHand_info.networksxHem.clustersLH,1);
rh_numvars = mean(RHand_info.networksxHem.clustersRH,1);
for net = 1:16
se_lh(net) = std(RHand_info.networksxHem.clustersLH(:,net))/sqrt(670);
se_rh(net) = std(RHand_info.networksxHem.clustersRH(:,net))/sqrt(670);
end
h = errorbar(lh_numvars, rh_numvars, se_rh, se_rh, se_lh, se_lh, 'o')
h.Color = [0,0,0];
scatter(lh_numvars, rh_numvars, 80, rgb_colors, 'd', 'filled')
hold on
scatter(lh_numvars, rh_numvars, 80, 'd','k')
```

```
axis([0 2.5 0 2.5])
line = refline(1,0);
line.Color = 'black';
xlabel('Left Hemisphere')
ylabel('Right Hemisphere')
ax = gca;
ax.FontSize = 24;
root_dir = '/Users/dianaperez/Desktop/Research/lateralization_code/'; % location of code↙
directory
data_location = [root_dir 'testing_output/'];
LHand_info = load([data_location 'HCP752_LH_networksxHem.mat']);
RHand_info = load([data_location 'HCP752_RH_networksxHem.mat']);
%plot left-handers
lh_numvars = mean(LHand_info.networksxHem.clustersLH,1);
rh_numvars = mean(LHand_info.networksxHem.clustersRH,1);
for net = 1:16
se_lh(net) = std(LHand_info.networksxHem.clustersLH(:,net))/sqrt(40);
se_rh(net) = std(LHand_info.networksxHem.clustersRH(:,net))/sqrt(40);
end
h = errorbar(lh_numvars, rh_numvars, se_rh, se_rh, se_lh, se_lh, 'o')
h.Color = [0,0,0];
hold on
scatter(lh_numvars, rh_numvars, 80, rgb_colors, 'filled')
hold on
scatter(lh_numvars, rh_numvars, 80, 'k')
% plot right-handers
lh_numvars = mean(RHand_info.networksxHem.clustersLH,1);
rh_numvars = mean(RHand_info.networksxHem.clustersRH,1);
for net = 1:16
se_lh(net) = std(RHand_info.networksxHem.clustersLH(:,net))/sqrt(670);
se_rh(net) = std(RHand_info.networksxHem.clustersRH(:,net))/sqrt(670);
end
h = errorbar(lh_numvars, rh_numvars, se_rh, se_rh, se_lh, se_lh, 'o')
h.Color = [0,0,0];
scatter(lh_numvars, rh_numvars, 80, rgb_colors, 'd', 'filled')
hold on
scatter(lh_numvars, rh_numvars, 80, 'd','k')
axis([0 2.5 0 2.5])
line = refline(1,0);
line.Color = 'black';
xlabel('Left Hemisphere')
ylabel('Right Hemisphere')
ax = gca;
ax.FontSize = 24;
print(gcf,↙
'/Users/dianaperez/Desktop/Research/lateralization_code/HCP752_numvars_LhandvRhand_scatte↙
rplot.jpg', '-dpng', '-r300')
close gcf
lh_numvars = mean(LHand_info.networksxHem.clustersLH,1);
rh_numvars = mean(LHand_info.networksxHem.clustersRH,1);
for net = 1:16
se_lh(net) = std(LHand_info.networksxHem.clustersLH(:,net))/sqrt(40);
se_rh(net) = std(LHand_info.networksxHem.clustersRH(:,net))/sqrt(40);
end
h = errorbar(lh_numvars, rh_numvars, se_rh, se_rh, se_lh, se_lh, 'o')
h.Color = [0,0,0];
hold on
scatter(lh_numvars, rh_numvars, 80, rgb_colors, 'filled')
hold on
scatter(lh_numvars, rh_numvars, 80, 'k')
```

```
line = refline(1,0);
line.Color = 'black';
xlabel('Left Hemisphere')
ylabel('Right Hemisphere')
ax = gca;
ax.FontSize = 24;
print(gcf,↙
'/Users/dianaperez/Desktop/Research/lateralization_code/HCP752_numvars_LhandvRhand_scatte↙
rplot.jpg', '-dpng', '-r300')
print(gcf,↙
'/Users/dianaperez/Desktop/Research/lateralization_code/HCP752_numvars_Lhand_scatterplot.↙
jpg', '-dpng', '-r300')
close gcf
lh_numvars = mean(RHand_info.networksxHem.clustersLH,1);
rh_numvars = mean(RHand_info.networksxHem.clustersRH,1);
for net = 1:16
se_lh(net) = std(RHand_info.networksxHem.clustersLH(:,net))/sqrt(670);
se_rh(net) = std(RHand_info.networksxHem.clustersRH(:,net))/sqrt(670);
end
h = errorbar(lh_numvars, rh_numvars, se_rh, se_rh, se_lh, se_lh, 'o')
h.Color = [0,0,0];
scatter(lh_numvars, rh_numvars, 80, rgb_colors, 'd', 'filled')
hold on
scatter(lh_numvars, rh_numvars, 80, 'd','k')
axis([0 2.5 0 2.5])
line = refline(1,0);
line.Color = 'black';
xlabel('Left Hemisphere')
ylabel('Right Hemisphere')
ax = gca;
ax.FontSize = 24;
print(gcf,↙
'/Users/dianaperez/Desktop/Research/lateralization_code/HCP752_numvars_Rhand_scatterplot.↙
jpg', '-dpng', '-r300')
close gcf
lh_numvars = mean(RHand_info.networksxHem.clustersLH,1);
rh_numvars = mean(RHand_info.networksxHem.clustersRH,1);
for net = 1:16
se_lh(net) = std(RHand_info.networksxHem.clustersLH(:,net))/sqrt(670);
se_rh(net) = std(RHand_info.networksxHem.clustersRH(:,net))/sqrt(670);
end
h = errorbar(lh_numvars, rh_numvars, se_rh, se_rh, se_lh, se_lh, 'o')
h.Color = [0,0,0];
hold on
scatter(lh_numvars, rh_numvars, 80, rgb_colors, 'd', 'filled')
hold on
scatter(lh_numvars, rh_numvars, 80, 'd','k')
axis([0 2.5 0 2.5])
line = refline(1,0);
line.Color = 'black';
xlabel('Left Hemisphere')
ylabel('Right Hemisphere')
ax = gca;
ax.FontSize = 24;
print(gcf,↙
'/Users/dianaperez/Desktop/Research/lateralization_code/HCP752_numvars_Rhand_scatterplot.↙
jpg', '-dpng', '-r300')
% load data
root_dir = '/Users/dianaperez/Desktop/Research/lateralization_code/'; % location of code↙
directory
```

```
data_location = [root_dir 'testing_output/'];
LHand_info = load([data_location 'HCP752_LH_networksxHem.mat']);
RHand_info = load([data_location 'HCP752_RH_networksxHem.mat']);
%plot left-handers
lh_numvars = mean(LHand_info.networksxHem.clustersLH,1);
rh_numvars = mean(LHand_info.networksxHem.clustersRH,1);
for net = 1:16
se_lh(net) = std(LHand_info.networksxHem.clustersLH(:,net))/sqrt(40);
se_rh(net) = std(LHand_info.networksxHem.clustersRH(:,net))/sqrt(40);
end
h = errorbar(lh_numvars, rh_numvars, se_rh, se_rh, se_lh, se_lh, 'o')
h.Color = [0,0,0];
hold on
scatter(lh_numvars, rh_numvars, 80, rgb_colors, 'filled')
hold on
scatter(lh_numvars, rh_numvars, 80, 'k')
% plot right-handers
lh_numvars = mean(RHand_info.networksxHem.clustersLH,1);
rh_numvars = mean(RHand_info.networksxHem.clustersRH,1);
for net = 1:16
se_lh(net) = std(RHand_info.networksxHem.clustersLH(:,net))/sqrt(670);
se_rh(net) = std(RHand_info.networksxHem.clustersRH(:,net))/sqrt(670);
end
h = errorbar(lh_numvars, rh_numvars, se_rh, se_rh, se_lh, se_lh, 'o')
h.Color = [0,0,0];
hold on
scatter(lh_numvars, rh_numvars, 80, rgb_colors, 'd', 'filled')
hold on
scatter(lh_numvars, rh_numvars, 80, 'd','k')
axis([0 2.5 0 2.5])
line = refline(1,0);
line.Color = 'black';
xlabel('Left Hemisphere')
ylabel('Right Hemisphere')
ax = gca;
ax.FontSize = 24;
print(gcf,↙
'/Users/dianaperez/Desktop/Research/lateralization_code/HCP752_numvars_LhandvRhand_scatte↙
rplot.jpg', '-dpng', '-r300')
%-- 3/17/22, 11:12 AM --%
wb_dir = '/Applications/workbench/bin_macosx64/';
group_avg =↙
'/Users/dianaperez/Desktop/Research/lateralization_code/group_avgs/120_LR_minsize400_reco↙
lored_manualconsensus_LR.dlabel.nii';
borderlabel_file = '/Users/dianaperez/Downloads/wbBorderLabelFile.txt';
output_dlabel = '/Users/dianaperez/Desktop/WashU120_labelfile_fornetoutlines.dlabel.nii';
system([wb_dir 'wb_command -cifti-label-import ' group_avg ' ' borderlabel_file ' '↙
output_dlabel])
dir = '/Applications/workbench/bin_macosx64/';
group_avg =↙
'/Users/dianaperez/Desktop/Research/lateralization_code/group_avgs/120_LR_minsize400_reco↙
lored_manualconsensus_LR.dlabel.nii';
borderlabel_file = '/Users/dianaperez/Downloads/wbBorderLabelFiles.txt';
output_dlabel = '/Users/dianaperez/Desktop/WashU120_labelfile_fornetoutlines.dlabel.nii';
system([wb_dir 'wb_command -cifti-label-import ' group_avg ' ' borderlabel_file ' '↙
output_dlabel])
wb_dir = '/Applications/workbench/bin_macosx64/';
group_avg =↙
'/Users/dianaperez/Desktop/Research/lateralization_code/group_avgs/120_LR_minsize400_reco↙
lored_manualconsensus_LR.dlabel.nii';
```

```
borderlabel_file = '/Users/dianaperez/Downloads/wbBorderLabelFile.txt';
output_dlabel = '/Users/dianaperez/Desktop/WashU120_labelfile_fornetoutlines.dlabel.nii';
system([wb_dir 'wb_command -cifti-label-import ' group_avg ' ' borderlabel_file ' '↙
output_dlabel])
output_lefthem = '/Users/dianaperez/Desktop/WashU120_labelfile_fornetoutlines_left.label.↙
gii';
output_righthem = '/Users/dianaperez/Desktop/WashU120_labelfile_fornetoutlines_right.↙
label.gii';
system([wb_dir 'wb_command -cifti-separate ' output_dlabel ' COLUMN -label CORTEX_LEFT '↙
output_lefthem ' -label CORTEX_RIGHT ' output_righthem])
system([wb_dir 'wb_command -label-to-border↙
/Users/dianaperez/Documents/Dependencies/32k_ConteAtlas_v2_distribute/Conte69_atlas-v2.↙
LR.32k_fs_LR.wb/Conte69.L.midthickness.32k_fs_LR.surf.gii ' output_lefthem↙
WashU120_netborders_L.border])
system([wb_dir 'wb_command -label-to-border↙
/Users/dianaperez/Documents/Dependencies/32k_ConteAtlas_v2_distribute/Conte69_atlas-v2.↙
LR.32k_fs_LR.wb/Conte69.R.midthickness.32k_fs_LR.surf.gii ' output_righthem↙
WashU120_netborders_R.border])
system([wb_dir 'wb_command -label-to-border↙
/Users/dianaperez/Documents/Dependencies/32k_ConteAtlas_v2_distribute/Conte69_atlas-v2.↙
LR.32k_fs_LR.wb/Conte69.L.midthickness.32k_fs_LR.surf.gii ' output_lefthem  '↙
WashU120_netborders_L.border'])
system([wb_dir 'wb_command -label-to-border↙
/Users/dianaperez/Documents/Dependencies/32k_ConteAtlas_v2_distribute/Conte69_atlas-v2.↙
LR.32k_fs_LR.wb/Conte69.R.midthickness.32k_fs_LR.surf.gii ' output_righthem  '↙
WashU120_netborders_R.border'])
cd /Users/dianaperez/Documents
cd Dependencies
cd 32k_ConteAtlas_v2_distribute/
system([wb_dir 'wb_command -label-to-border↙
/Users/dianaperez/Documents/Dependencies/Resources/Conte69_atlas-v2.LR.32k_fs_LR.↙
wb/Conte69.L.midthickness.32k_fs_LR.surf.gii ' output_lefthem  ' WashU120_netborders_L.↙
border'])
system([wb_dir 'wb_command -label-to-border↙
/Users/dianaperez/Documents/Dependencies/Resources/Conte69_atlas-v2.LR.32k_fs_LR.↙
wb/Conte69.R.midthickness.32k_fs_LR.surf.gii ' output_righthem  ' WashU120_netborders_R.↙
border'])
load('/Users/dianaperez/Desktop/Research/lateralization_code/HCP384_net_assignments.mat')
net_specific_diffmap
addpath '/Users/dianaperez/Documents/GitHub/PerezEtAl_HemAsymmetries'
net_specific_diffmap
template.brainstructure>0
whole_map = [diff_map; diff_map];
diff_map = whole_map(template.brainstructure>0);
template.data = diff_map;
ft_write_cifti_mod([output_dir out_str '_' network_names{network_id} '_Variants_DiffMap.↙
dtseries.nii'], template);
net_specific_diffmap
var_freq_size_net
clear all
load↙
('/Users/dianaperez/Desktop/Research/lateralization_code/testing_output/HCP752_new_split_↙
LH_networksxHem.mat')
network_names = {'DMN'  'Vis'   'FP'    'DAN'   'Lang'  'Sal'   'CO'    'SMd'   'SMl'↙
'Aud'   'Tpole' 'MTL'   'PMN'   'PON'};
good_nets_LH = [networksxHem.verticesLH(:,1:3) networksxHem.verticesLH(:,5) networksxHem.↙
verticesLH(:,7:end)];
good_nets_LH = [networksxHem.clustersLH(:,1:3) networksxHem.clustersLH(:,5) networksxHem.↙
clustersLH(:,7:end)];
good_nets_RH = [networksxHem.clustersRH(:,1:3) networksxHem.clustersRH(:,5) networksxHem.↙
```

```
clustersRH(:,7:end)];
good_nets_LH = mean(good_nets_LH);
good_nets_RH = mean(good_nets_RH);
means = [good_nets_LH' good_nets_RH'];
bar(1:14, means)
legend('Left Hem', 'Right Hem')
xticks(1:14)
xticklabels(network_names)
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.5, 0.7, 0.9, 0.7]);
ylabel('Average Number of Variant Regions')
xlabel('Network');
title('Variant Regions Assigned to Each Network Across Hemispheres')
ax = gca;
ax.FontSize = 24;
for net = 1:16
se_lh(net) = std(networksxHem.clustersLH(:,net))/sqrt(40);
se_rh(net) = std(networksxHem.clustersRH(:,net))/sqrt(40);
end
se_lh(4) = [];
se_lh(5) = [];
se_rh(4) = [];
se_rh(5) = [];
hold on
h = errorbar(1:14, means, se_lh, se_lh, se_rh, se_rh, 'o')
h = errorbar(means, se_lh, se_lh, se_rh, se_rh, 'o')
h = errorbar(1:14, means(:,1), se_lh, se_lh, 'o')
bar(1:14, means)
legend('Left Hem', 'Right Hem')
xticks(1:14)
xticklabels(network_names)
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.5, 0.7, 0.9, 0.7]);
ylabel('Average Number of Variant Regions')
xlabel('Network');
title('Variant Regions Assigned to Each Network Across Hemispheres')
ax = gca;
ax.FontSize = 24;
h = errorbar(.5:1:13.5, means(:,1), se_lh, se_lh)
close gcf
bar(1:14, means)
legend('Left Hem', 'Right Hem')
xticks(1:14)
xticklabels(network_names)
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.5, 0.7, 0.9, 0.7]);
ylabel('Average Number of Variant Regions')
xlabel('Network');
title('Variant Regions Assigned to Each Network Across Hemispheres')
ax = gca;
ax.FontSize = 24;
hold on
h = errorbar(.5:1:13.5, means(:,1), se_lh, se_lh)
close gcf
bar(1:14, means)
legend('Left Hem', 'Right Hem')
xticks(1:14)
xticklabels(network_names)
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.5, 0.7, 0.9, 0.7]);
ylabel('Average Number of Variant Regions')
xlabel('Network');
title('Variant Regions Assigned to Each Network Across Hemispheres')
ax = gca;
```

```
ax.FontSize = 24;
hold on
h = errorbar(.75:1:13.75, means(:,1), se_lh, se_lh)
h = errorbar(.95:1:13.95, means(:,1), se_lh, se_lh)
h = errorbar(.90:1:13.90, means(:,1), se_lh, se_lh)
h = errorbar(.85:1:13.85, means(:,1), se_lh, se_lh)
close gcf
bar(1:14, means)
legend('Left Hem', 'Right Hem')
xticks(1:14)
xticklabels(network_names)
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.5, 0.7, 0.9, 0.7]);
ylabel('Average Number of Variant Regions')
xlabel('Network');
title('Variant Regions Assigned to Each Network Across Hemispheres')
ax = gca;
ax.FontSize = 24;
hold on
h = errorbar([1:14 1:14, means, se_lh, se_lh, se_rh, se_rh)
h = errorbar([1:14 1:14], means, se_lh, se_lh, se_rh, se_rh)
h = errorbar([1:14; 1:14], means, se_lh, se_lh, se_rh, se_rh)
h = errorbar([1:14; 1:14], means, [se_lh; se_rh], [se_lh; se_rh])
[1:14; 1:14]
h = errorbar([1:14; 1:14]', means, [se_lh; se_rh]', [se_lh; se_rh]')
bar(1:14, means)
legend('Left Hem', 'Right Hem')
xticks(1:14)
xticklabels(network_names)
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.5, 0.7, 0.9, 0.7]);
ylabel('Average Number of Variant Regions')
xlabel('Network');
title('Variant Regions Assigned to Each Network Across Hemispheres')
ax = gca;
ax.FontSize = 24;
hold on
h = errorbar(.85:1:13.85, means(:,1), se_lh, se_lh)
h.Color = [0,0,0];
g = errorbar(1.15:1:14.15, means(:,1), se_lh, se_lh)
g.Color = [0,0,0];
close gcf
bar(1:14, means)
legend('Left Hem', 'Right Hem')
xticks(1:14)
xticklabels(network_names)
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.5, 0.7, 0.9, 0.7]);
ylabel('Average Number of Variant Regions')
xlabel('Network');
title('Variant Regions Assigned to Each Network Across Hemispheres')
ax = gca;
ax.FontSize = 24;
hold on
h = errorbar(.85:1:13.85, means(:,1), se_lh, se_lh)
h.Color = [0,0,0];
g = errorbar(1.15:1:14.15, means(:,1), se_rh, se_rh)
g.Color = [0,0,0];
h.LineStyle = 'none';
g.LineStyle = 'none';
close gcf
bar(1:14, means)
legend('Left Hem', 'Right Hem')
```

```
xticks(1:14)
xticklabels(network_names)
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.5, 0.7, 0.9, 0.7]);
ylabel('Average Number of Variant Regions')
xlabel('Network');
title('Variant Regions Assigned to Each Network Across Hemispheres')
ax = gca;
ax.FontSize = 24;
hold on
h = errorbar(.85:1:13.85, means(:,1), se_lh, se_lh)
h.Color = [0,0,0];
g = errorbar(1.15:1:14.15, means(:,2), se_rh, se_rh)
g.Color = [0,0,0];
h.LineStyle = 'none';
g.LineStyle = 'none';
h.LineWidth = 2;
g.LineWidth = 2;
legend('Left Hem', 'Right Hem')
print(gcf,↙
'/Users/dianaperez/Desktop/Research/lateralization_code/HCP752_numvars_Lhand_leftvrighthe↙
m.jpg', '-dpng', '-r300')
left_handers = networksxHem;
load↙
('/Users/dianaperez/Desktop/Research/lateralization_code/testing_output/HCP752_new_split_↙
RH_networksxHem.mat')
network_names = {'DMN'  'Vis'   'FP'    'DAN'   'Lang'  'Sal'   'CO'    'SMd'   'SMl'↙
'Aud'   'Tpole' 'MTL'   'PMN'   'PON'};
good_nets_LH = [networksxHem.verticesLH(:,1:3) networksxHem.verticesLH(:,5) networksxHem.↙
verticesLH(:,7:end)];
good_nets_LH = [networksxHem.clustersLH(:,1:3) networksxHem.clustersLH(:,5) networksxHem.↙
clustersLH(:,7:end)];
good_nets_RH = [networksxHem.clustersRH(:,1:3) networksxHem.clustersRH(:,5) networksxHem.↙
clustersRH(:,7:end)];
good_nets_LH = mean(good_nets_LH);
good_nets_RH = mean(good_nets_RH);
means = [good_nets_LH' good_nets_RH'];
for net = 1:16
se_lh(net) = std(networksxHem.clustersLH(:,net))/sqrt(670);
se_rh(net) = std(networksxHem.clustersRH(:,net))/sqrt(670);
end
se_lh(4) = [];
se_lh(5) = [];
se_rh(4) = [];
se_rh(5) = [];
bar(1:14, means)
legend('Left Hem', 'Right Hem')
xticks(1:14)
xticklabels(network_names)
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.5, 0.7, 0.9, 0.7]);
ylabel('Average Number of Variant Regions')
xlabel('Network');
title('Variant Regions Assigned to Each Network Across Hemispheres')
ax = gca;
ax.FontSize = 24;
hold on
h = errorbar(.85:1:13.85, means(:,1), se_lh, se_lh)
h.Color = [0,0,0];
g = errorbar(1.15:1:14.15, means(:,2), se_rh, se_rh)
g.Color = [0,0,0];
h.LineStyle = 'none';
```

```
g.LineStyle = 'none';
h.LineWidth = 2;
g.LineWidth = 2;
legend('Left Hem', 'Right Hem')
close gcf
load↙
('/Users/dianaperez/Desktop/Research/lateralization_code/testing_output/HCP752_new_split_↙
RH_networksxHem.mat')
network_names = {'DMN'  'Vis'   'FP'    'DAN'   'Lang'  'Sal'   'CO'    'SMd'   'SMl'↙
'Aud'   'Tpole' 'MTL'   'PMN'   'PON'};
good_nets_LH = [networksxHem.verticesLH(:,1:3) networksxHem.verticesLH(:,5) networksxHem.↙
verticesLH(:,7:end)];
good_nets_LH = [networksxHem.clustersLH(:,1:3) networksxHem.clustersLH(:,5) networksxHem.↙
clustersLH(:,7:end)];
good_nets_RH = [networksxHem.clustersRH(:,1:3) networksxHem.clustersRH(:,5) networksxHem.↙
clustersRH(:,7:end)];
good_nets_LH = mean(good_nets_LH);
good_nets_RH = mean(good_nets_RH);
means = [good_nets_LH' good_nets_RH'];
for net = 1:16
se_lh(net) = std(networksxHem.clustersLH(:,net))/sqrt(670);
se_rh(net) = std(networksxHem.clustersRH(:,net))/sqrt(670);
end
se_lh(4) = [];
se_lh(5) = [];
se_rh(4) = [];
se_rh(5) = [];
bar(1:14, means)
legend('Left Hem', 'Right Hem')
xticks(1:14)
xticklabels(network_names)
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.5, 0.7, 0.9, 0.7]);
ylabel('Average Number of Variant Regions')
xlabel('Network');
title('Variant Regions Assigned to Each Network Across Hemispheres')
ax = gca;
ax.FontSize = 24;
hold on
h = errorbar(.85:1:13.85, means(:,1), se_lh, se_lh)
h.Color = [0,0,0];
g = errorbar(1.15:1:14.15, means(:,2), se_rh, se_rh)
g.Color = [0,0,0];
h.LineStyle = 'none';
g.LineStyle = 'none';
h.LineWidth = 2;
g.LineWidth = 2;
legend('Left Hem', 'Right Hem')
print(gcf,↙
'/Users/dianaperez/Desktop/Research/lateralization_code/HCP752_numvars_Rhand_leftvrighthe↙
m.jpg', '-dpng', '-r300')
close gcf
right_handers = networksxHem;
mean_lefthanders_LH = mean(left_handers.clustersLH);
mean_lefthanders_RH = mean(left_handers.clustersRH);
mean_righthanders_LH = mean(right_handers.clustersLH);
mean_righthanders_RH = mean(right_handers.clustersRH);
diff_lefthanders = mean_lefthanders_LH - mean_lefthanders_RH;
diff_righthanders = mean_righthanders_LH - mean_righthanders_RH;
diff_lefthanders = left_handers.clustersLH - left_handers.clustersRH;
mean_diff_lefthanders = mean(diff_lefthanders, 1);
```

```
diff_righthanders = right_handers.clustersLH - right_handers.clustersRH;
mean_diff_righthanders = mean(diff_righthanders, 1);
diff_lefthanders(4) = [], diff_lefthanders(5) = [];
diff_righthanders(4) = [], diff_righthanders(5) = [];
diff_lefthanders = mean_lefthanders_LH - mean_lefthanders_RH;
diff_righthanders = mean_righthanders_LH - mean_righthanders_RH;
diff_lefthanders(4) = []
diff_lefthanders(5) = [];
diff_righthanders(4) = []; diff_righthanders(5) = [];
bar(1:14, diffs)
legend('Left Handers', 'Right Handers')
xticks(1:14)
xticklabels(network_names)
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.5, 0.7, 0.9, 0.7]);
ylabel('Difference in Average Number of Variant Regions (left - right hem)')
xlabel('Network');
diffs = [diff_lefthanders; diff_righthanders];
bar(1:14, diffs)
legend('Left Handers', 'Right Handers')
xticks(1:14)
xticklabels(network_names)
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.5, 0.7, 0.9, 0.7]);
ylabel('Difference in Average Number of Variant Regions (left - right hem)')
xlabel('Network');
ax = gca;
ax.FontSize = 24;
hold on
diff_lefthanders = left_handers.clustersLH - left_handers.clustersRH;
mean_diff_lefthanders = mean(diff_lefthanders, 1);
diff_righthanders = right_handers.clustersLH - right_handers.clustersRH;
mean_diff_righthanders = mean(diff_righthanders, 1);
load↙
('/Users/dianaperez/Desktop/Research/lateralization_code/testing_output/HCP752_new_split_↙
RH_networksxHem.mat')
M
load↙
('/Users/dianaperez/Desktop/Research/lateralization_code/testing_output/HCP752_new_split_↙
MH_networksxHem.mat')
load↙
('/Users/dianaperez/Desktop/Research/lateralization_code/testing_output/HCP752_new_split_↙
RH_networksxHem.mat')
load↙
('/Users/dianaperez/Desktop/Research/lateralization_code/testing_output/HCP752_new_split_↙
RH_matched_networksxHem.mat')
load↙
('/Users/dianaperez/Desktop/Research/lateralization_code/testing_output/HCP752_new_split_↙
RH_networksxHem.mat')
load↙
('/Users/dianaperez/Desktop/Research/lateralization_code/testing_output/HCP752_new_split_↙
MH_networksxHem.mat')
load↙
('/Users/dianaperez/Desktop/Research/lateralization_code/testing_output/HCP752_new_split_↙
RH_matched_networksxHem.mat')
load↙
('/Users/dianaperez/Desktop/Research/lateralization_code/testing_output/HCP752_new_split_↙
RH_networksxHem.mat')
load↙
('/Users/dianaperez/Desktop/Research/lateralization_code/testing_output/HCP752_RH_network↙
sxHem.mat')
clear all
```

```
load↙
('/Users/dianaperez/Desktop/Research/lateralization_code/testing_output/HCP752_RH_network↙
sxHem.mat')
network_names = {'DMN'  'Vis'   'FP'    'DAN'   'Lang'  'Sal'   'CO'    'SMd'   'SMl'↙
'Aud'   'Tpole' 'MTL'   'PMN'   'PON'};
good_nets_LH = [networksxHem.verticesLH(:,1:3) networksxHem.verticesLH(:,5) networksxHem.↙
verticesLH(:,7:end)];
good_nets_LH = [networksxHem.clustersLH(:,1:3) networksxHem.clustersLH(:,5) networksxHem.↙
clustersLH(:,7:end)];
good_nets_RH = [networksxHem.clustersRH(:,1:3) networksxHem.clustersRH(:,5) networksxHem.↙
clustersRH(:,7:end)];
good_nets_LH = mean(good_nets_LH);
good_nets_RH = mean(good_nets_RH);
means = [good_nets_LH' good_nets_RH'];
for net = 1:16
se_lh(net) = std(networksxHem.clustersLH(:,net))/sqrt(670);
se_rh(net) = std(networksxHem.clustersRH(:,net))/sqrt(670);
end
se_lh(4) = [];
se_lh(5) = [];
se_rh(4) = [];
se_rh(5) = [];
bar(1:14, means)
legend('Left Hem', 'Right Hem')
xticks(1:14)
xticklabels(network_names)
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.5, 0.7, 0.9, 0.7]);
ylabel('Average Number of Variant Regions')
xlabel('Network');
title('Variant Regions Assigned to Each Network Across Hemispheres')
ax = gca;
ax.FontSize = 24;
hold on
h = errorbar(.85:1:13.85, means(:,1), se_lh, se_lh)
h.Color = [0,0,0];
g = errorbar(1.15:1:14.15, means(:,2), se_rh, se_rh)
g.Color = [0,0,0];
h.LineStyle = 'none';
g.LineStyle = 'none';
h.LineWidth = 2;
g.LineWidth = 2;
legend('Left Hem', 'Right Hem')
print(gcf,↙
'/Users/dianaperez/Desktop/Research/lateralization_code/HCP752_numvars_Rhand_leftvrighthe↙
m.jpg', '-dpng', '-r300')
close gcf
load↙
('/Users/dianaperez/Desktop/Research/lateralization_code/testing_output/HCP752_RH_network↙
sxHem.mat')
network_names = {'DMN'  'Vis'   'FP'    'DAN'   'Lang'  'Sal'   'CO'    'SMd'   'SMl'↙
'Aud'   'Tpole' 'MTL'   'PMN'   'PON'};
good_nets_LH = [networksxHem.verticesLH(:,1:3) networksxHem.verticesLH(:,5) networksxHem.↙
verticesLH(:,7:end)];
good_nets_LH = [networksxHem.clustersLH(:,1:3) networksxHem.clustersLH(:,5) networksxHem.↙
clustersLH(:,7:end)];
good_nets_RH = [networksxHem.clustersRH(:,1:3) networksxHem.clustersRH(:,5) networksxHem.↙
clustersRH(:,7:end)];
good_nets_LH = mean(good_nets_LH);
good_nets_RH = mean(good_nets_RH);
means = [good_nets_LH' good_nets_RH'];
```

```
for net = 1:16
se_lh(net) = std(networksxHem.clustersLH(:,net))/sqrt(670);
se_rh(net) = std(networksxHem.clustersRH(:,net))/sqrt(670);
end
se_lh(4) = [];
se_lh(5) = [];
se_rh(4) = [];
se_rh(5) = [];
bar(1:14, means)
legend('Left Hem', 'Right Hem')
xticks(1:14)
xticklabels(network_names)
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.5, 0.7, 0.9, 0.7]);
ylabel('Average Number of Variant Regions')
xlabel('Network');
title('Variant Regions Assigned to Each Network Across Hemispheres')
ax = gca;
ax.FontSize = 24;
hold on
h = errorbar(.85:1:13.85, means(:,1), se_lh, se_lh)
h.Color = [0,0,0];
g = errorbar(1.15:1:14.15, means(:,2), se_rh, se_rh)
g.Color = [0,0,0];
h.LineStyle = 'none';
g.LineStyle = 'none';
h.LineWidth = 2;
g.LineWidth = 2;
legend('Left Hem', 'Right Hem')
print(gcf,↙
'/Users/dianaperez/Desktop/Research/lateralization_code/HCP752_numvars_Rhand_leftvrighthe↙
m.jpg', '-dpng', '-r300')
help axis
axis([0,2.5, 0,15])
axis([0,15,0,2.5])
load↙
('/Users/dianaperez/Desktop/Research/lateralization_code/testing_output/HCP752_RH_network↙
sxHem.mat')
network_names = {'DMN'  'Vis'   'FP'    'DAN'   'Lang'  'Sal'   'CO'    'SMd'   'SMl'↙
'Aud'   'Tpole' 'MTL'   'PMN'   'PON'};
good_nets_LH = [networksxHem.verticesLH(:,1:3) networksxHem.verticesLH(:,5) networksxHem.↙
verticesLH(:,7:end)];
good_nets_LH = [networksxHem.clustersLH(:,1:3) networksxHem.clustersLH(:,5) networksxHem.↙
clustersLH(:,7:end)];
good_nets_RH = [networksxHem.clustersRH(:,1:3) networksxHem.clustersRH(:,5) networksxHem.↙
clustersRH(:,7:end)];
good_nets_LH = mean(good_nets_LH);
good_nets_RH = mean(good_nets_RH);
means = [good_nets_LH' good_nets_RH'];
for net = 1:16
se_lh(net) = std(networksxHem.clustersLH(:,net))/sqrt(670);
se_rh(net) = std(networksxHem.clustersRH(:,net))/sqrt(670);
end
se_lh(4) = [];
se_lh(5) = [];
se_rh(4) = [];
se_rh(5) = [];
bar(1:14, means)
legend('Left Hem', 'Right Hem')
xticks(1:14)
xticklabels(network_names)
```

```
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.5, 0.7, 0.9, 0.7]);
ylabel('Average Number of Variant Regions')
xlabel('Network');
title('Variant Regions Assigned to Each Network Across Hemispheres')
ax = gca;
ax.FontSize = 24;
hold on
h = errorbar(.85:1:13.85, means(:,1), se_lh, se_lh)
h.Color = [0,0,0];
g = errorbar(1.15:1:14.15, means(:,2), se_rh, se_rh)
g.Color = [0,0,0];
h.LineStyle = 'none';
g.LineStyle = 'none';
h.LineWidth = 2;
g.LineWidth = 2;
legend('Left Hem', 'Right Hem')
print(gcf,↙
'/Users/dianaperez/Desktop/Research/lateralization_code/HCP752_numvars_Rhand_leftvrighthe↙
m.jpg', '-dpng', '-r300')
axis([0,15,0,2.5])
print(gcf,↙
'/Users/dianaperez/Desktop/Research/lateralization_code/HCP752_numvars_Rhand_leftvrighthe↙
m.jpg', '-dpng', '-r300')
right_handers = networksxHem;
close gcf
load↙
('/Users/dianaperez/Desktop/Research/lateralization_code/testing_output/HCP752_new_split_↙
LH_networksxHem.mat')
network_names = {'DMN'  'Vis'   'FP'    'DAN'   'Lang'  'Sal'   'CO'    'SMd'   'SMl'↙
'Aud'   'Tpole' 'MTL'   'PMN'   'PON'};
good_nets_LH = [networksxHem.verticesLH(:,1:3) networksxHem.verticesLH(:,5) networksxHem.↙
verticesLH(:,7:end)];
good_nets_LH = [networksxHem.clustersLH(:,1:3) networksxHem.clustersLH(:,5) networksxHem.↙
clustersLH(:,7:end)];
good_nets_RH = [networksxHem.clustersRH(:,1:3) networksxHem.clustersRH(:,5) networksxHem.↙
clustersRH(:,7:end)];
good_nets_LH = mean(good_nets_LH);
good_nets_RH = mean(good_nets_RH);
means = [good_nets_LH' good_nets_RH'];
for net = 1:16
se_lh(net) = std(networksxHem.clustersLH(:,net))/sqrt(40);
se_rh(net) = std(networksxHem.clustersRH(:,net))/sqrt(40);
end
se_lh(4) = [];
se_lh(5) = [];
se_rh(4) = [];
se_rh(5) = [];
bar(1:14, means)
legend('Left Hem', 'Right Hem')
xticks(1:14)
xticklabels(network_names)
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.5, 0.7, 0.9, 0.7]);
ylabel('Average Number of Variant Regions')
xlabel('Network');
title('Variant Regions Assigned to Each Network Across Hemispheres')
ax = gca;
ax.FontSize = 24;
hold on
h = errorbar(.85:1:13.85, means(:,1), se_lh, se_lh)
h.Color = [0,0,0];
```

```
g = errorbar(1.15:1:14.15, means(:,2), se_rh, se_rh)
g.Color = [0,0,0];
h.LineStyle = 'none';
g.LineStyle = 'none';
h.LineWidth = 2;
g.LineWidth = 2;
legend('Left Hem', 'Right Hem')
print(gcf,↙
'/Users/dianaperez/Desktop/Research/lateralization_code/HCP752_numvars_Lhand_leftvrighthe↙
m.jpg', '-dpng', '-r300')
close gcf
left_handers = networksxHem;
diff_lefthanders = left_handers.clustersLH - left_handers.clustersRH;
mean_diff_lefthanders = mean(diff_lefthanders, 1);
diff_righthanders = right_handers.clustersLH - right_handers.clustersRH;
mean_diff_righthanders = mean(diff_righthanders, 1);
for net = 1:16
se_lh(net) = std(diff_lefthanders(:,net))/sqrt(40);
se_rh(net) = std(diff_righthanders(:,net))/sqrt(670);
end
se_lh(4) = [];
se_lh(5) = [];
se_rh(4) = [];
se_rh(5) = [];
diffs = [mean_diff_lefthanders; mean_diff_righthanders];
bar(1:14, diffs)
diffs(:,4) = []; diff(:,5) = [];
diffs(:,5) = []
bar(1:14, diffs)
legend('Left Handers', 'Right Handers')
xticks(1:14)
xticklabels(network_names)
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.5, 0.7, 0.9, 0.7]);
ylabel('Difference in Average Number of Variant Regions (left - right hem)')
xlabel('Network');
ax = gca;
ax.FontSize = 24;
hold on
h = errorbar(.85:1:13.85, diffs(:,1), se_lh, se_lh)
h.Color = [0,0,0];
g = errorbar(1.15:1:14.15, diffs(:,2), se_rh, se_rh)
g.Color = [0,0,0];
h.LineStyle = 'none';
g.LineStyle = 'none';
h.LineWidth = 2;
g.LineWidth = 2;
h = errorbar(.85:1:13.85, diffs(1,:), se_lh, se_lh)
h.Color = [0,0,0];
g = errorbar(1.15:1:14.15, diffs(2,:), se_rh, se_rh)
g.Color = [0,0,0];
h.LineStyle = 'none';
g.LineStyle = 'none';
h.LineWidth = 2;
g.LineWidth = 2;
legend('Left Handers', 'Right Handers')
print(gcf,↙
'/Users/dianaperez/Desktop/Research/lateralization_code/HCP752_numvars_LvRhand_L-Rhem.↙
jpg', '-dpng', '-r300')
close gcf
load↙
```

```
('/Users/dianaperez/Desktop/Research/lateralization_code/testing_output/HCP752_new_split_↙
LH_networksxHem.mat')
network_names = {'DMN'  'Vis'   'FP'    'DAN'   'Lang'  'Sal'   'CO'    'SMd'   'SMl'↙
'Aud'   'Tpole' 'MTL'   'PMN'   'PON'};
good_nets_LH = [networksxHem.verticesLH(:,1:3) networksxHem.verticesLH(:,5) networksxHem.↙
verticesLH(:,7:end)];
good_nets_LH = [networksxHem.clustersLH(:,1:3) networksxHem.clustersLH(:,5) networksxHem.↙
clustersLH(:,7:end)];
good_nets_RH = [networksxHem.clustersRH(:,1:3) networksxHem.clustersRH(:,5) networksxHem.↙
clustersRH(:,7:end)];
good_nets_LH = mean(good_nets_LH);
good_nets_RH = mean(good_nets_RH);
means = [good_nets_LH' good_nets_RH'];
for net = 1:16
se_lh(net) = std(networksxHem.clustersLH(:,net))/sqrt(40);
se_rh(net) = std(networksxHem.clustersRH(:,net))/sqrt(40);
end
se_lh(4) = [];
se_lh(5) = [];
se_rh(4) = [];
se_rh(5) = [];
bar(1:14, means)
legend('Left Hem', 'Right Hem')
xticks(1:14)
xticklabels(network_names)
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.5, 0.7, 0.9, 0.7]);
ylabel('Average Number of Variant Regions')
xlabel('Network');
title('Variant Regions Assigned to Each Network Across Hemispheres')
ax = gca;
ax.FontSize = 24;
hold on
h = errorbar(.85:1:13.85, means(:,1), se_lh, se_lh)
h.Color = [0,0,0];
g = errorbar(1.15:1:14.15, means(:,2), se_rh, se_rh)
g.Color = [0,0,0];
h.LineStyle = 'none';
g.LineStyle = 'none';
h.LineWidth = 2;
g.LineWidth = 2;
legend('Left Hem', 'Right Hem')
print(gcf,↙
'/Users/dianaperez/Desktop/Research/lateralization_code/HCP752_numvars_Lhand_leftvrighthe↙
m.jpg', '-dpng', '-r300')
close gcf
left_handers = networksxHem;
%% right handers
load↙
('/Users/dianaperez/Desktop/Research/lateralization_code/testing_output/HCP752_RH_network↙
sxHem.mat')
network_names = {'DMN'  'Vis'   'FP'    'DAN'   'Lang'  'Sal'   'CO'    'SMd'   'SMl'↙
'Aud'   'Tpole' 'MTL'   'PMN'   'PON'};
good_nets_LH = [networksxHem.verticesLH(:,1:3) networksxHem.verticesLH(:,5) networksxHem.↙
verticesLH(:,7:end)];
good_nets_LH = [networksxHem.clustersLH(:,1:3) networksxHem.clustersLH(:,5) networksxHem.↙
clustersLH(:,7:end)];
good_nets_RH = [networksxHem.clustersRH(:,1:3) networksxHem.clustersRH(:,5) networksxHem.↙
clustersRH(:,7:end)];
good_nets_LH = mean(good_nets_LH);
good_nets_RH = mean(good_nets_RH);
```

```
means = [good_nets_LH' good_nets_RH'];
for net = 1:16
se_lh(net) = std(networksxHem.clustersLH(:,net))/sqrt(670);
se_rh(net) = std(networksxHem.clustersRH(:,net))/sqrt(670);
end
se_lh(4) = [];
se_lh(5) = [];
se_rh(4) = [];
se_rh(5) = [];
bar(1:14, means)
legend('Left Hem', 'Right Hem')
xticks(1:14)
xticklabels(network_names)
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.5, 0.7, 0.9, 0.7]);
ylabel('Average Number of Variant Regions')
xlabel('Network');
title('Variant Regions Assigned to Each Network Across Hemispheres')
ax = gca;
ax.FontSize = 24;
hold on
h = errorbar(.85:1:13.85, means(:,1), se_lh, se_lh)
h.Color = [0,0,0];
g = errorbar(1.15:1:14.15, means(:,2), se_rh, se_rh)
g.Color = [0,0,0];
h.LineStyle = 'none';
g.LineStyle = 'none';
h.LineWidth = 2;
g.LineWidth = 2;
legend('Left Hem', 'Right Hem')
axis([0,15,0,2.5])
print(gcf,↙
'/Users/dianaperez/Desktop/Research/lateralization_code/HCP752_numvars_Rhand_leftvrighthe↙
m.jpg', '-dpng', '-r300')
close gcf
right_handers = networksxHem;
%% difference (left - right)
% mean_lefthanders_LH = mean(left_handers.clustersLH);
% mean_lefthanders_RH = mean(left_handers.clustersRH);
% mean_righthanders_LH = mean(right_handers.clustersLH);
% mean_righthanders_RH = mean(right_handers.clustersRH);
% diff_lefthanders = mean_lefthanders_LH - mean_lefthanders_RH;
% diff_righthanders = mean_righthanders_LH - mean_righthanders_RH;
% diff_lefthanders(4) = []; diff_lefthanders(5) = [];
% diff_righthanders(4) = []; diff_righthanders(5) = [];
% diffs = [diff_lefthanders; diff_righthanders];
%% OR
diff_lefthanders = left_handers.clustersLH - left_handers.clustersRH;
mean_diff_lefthanders = mean(diff_lefthanders, 1);
diff_righthanders = right_handers.clustersLH - right_handers.clustersRH;
mean_diff_righthanders = mean(diff_righthanders, 1);
for net = 1:16
se_lh(net) = std(diff_lefthanders(:,net))/sqrt(40);
se_rh(net) = std(diff_righthanders(:,net))/sqrt(670);
end
se_lh(4) = [];
se_lh(5) = [];
se_rh(4) = [];
se_rh(5) = [];
diffs = [mean_diff_lefthanders; mean_diff_righthanders];
diffs(:,4) = []; diffs(:,5) = [];
```

```
bar(1:14, diffs)
legend('Left Handers', 'Right Handers')
xticks(1:14)
xticklabels(network_names)
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.5, 0.7, 0.9, 0.7]);
ylabel('Difference in Average Number of Variant Regions (left - right hem)')
xlabel('Network');
ax = gca;
ax.FontSize = 24;
hold on
h = errorbar(.85:1:13.85, diffs(1,:), se_lh, se_lh)
h.Color = [0,0,0];
g = errorbar(1.15:1:14.15, diffs(2,:), se_rh, se_rh)
g.Color = [0,0,0];
h.LineStyle = 'none';
g.LineStyle = 'none';
h.LineWidth = 2;
g.LineWidth = 2;
legend('Left Handers', 'Right Handers')
print(gcf,↙
'/Users/dianaperez/Desktop/Research/lateralization_code/HCP752_numvars_LvRhand_L-Rhem.↙
jpg', '-dpng', '-r300')
close gcf
diff_lefthanders = left_handers.clustersLH - left_handers.clustersRH;
mean_diff_lefthanders = mean(diff_lefthanders, 1);
diff_righthanders = right_handers.clustersLH - right_handers.clustersRH;
mean_diff_righthanders = mean(diff_righthanders, 1);
for net = 1:16
se_lh(net) = std(diff_lefthanders(:,net))/sqrt(40);
se_rh(net) = std(diff_righthanders(:,net))/sqrt(670);
end
se_lh(4) = [];
se_lh(5) = [];
se_rh(4) = [];
se_rh(5) = [];
diffs = [mean_diff_lefthanders; mean_diff_righthanders];
diffs(:,4) = []; diffs(:,5) = [];
b = bar(1:14, diffs)
legend('Left Handers', 'Right Handers')
b(1).FaceColor = [.2 .6 .5];
b(2).FaceColor = [0.4940 0.1840 0.5560];
xticks(1:14)
xticklabels(network_names)
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.5, 0.7, 0.9, 0.7]);
ylabel('Difference in Average Number of Variant Regions (left - right hem)')
xlabel('Network');
ax = gca;
ax.FontSize = 24;
hold on
h = errorbar(.85:1:13.85, diffs(1,:), se_lh, se_lh)
h.Color = [0,0,0];
g = errorbar(1.15:1:14.15, diffs(2,:), se_rh, se_rh)
g.Color = [0,0,0];
h.LineStyle = 'none';
g.LineStyle = 'none';
h.LineWidth = 2;
g.LineWidth = 2;
legend('Left Handers', 'Right Handers')
print(gcf,↙
'/Users/dianaperez/Desktop/Research/lateralization_code/HCP752_numvars_LvRhand_L-Rhem.↙
```

```
jpg', '-dpng', '-r300')
ylabel(' ')
xlabel(' ');
print(gcf,↙
'/Users/dianaperez/Desktop/Research/lateralization_code/HCP752_numvars_LvRhand_L-Rhem.↙
jpg', '-dpng', '-r300')
EmReg_task
sca
%-- 3/19/22, 1:15 PM --%
EmReg_task
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1
1
1
1
sca
```

```
EmReg_task
1
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1
1
1
1
1
1
1
1
1
1
sca
%-- 3/21/22, 9:54 AM --%
cd /Volumes/RESEARCH_HD
EmReg_task
isempty(input_condition)
input_condition{1}>4
input_condition{1}
isnum(input_condition{1})
isenum(input_condition{1})
help ischar
isnumeric(input_condition{1})
help inputdlg
cell2mat(input_condition{1})
cell2mat(input_condition)
isnumeric(ans)
num=cell2mat(input_condition)
ischar(num
ischar(num)
num=str2num(input_condition)
num=str2num(input_condition{1})
EmReg_task
%-- 3/21/22, 10:16 AM --%
EmReg_task
%-- 3/21/22, 10:21 AM --%
EmReg_task
cd /Volumes/RESEARCH_HD
EmReg_task
1
1
1
1
1
1
1
1
1
1
1
1
1
1
sca
EmReg_task
```

```
0
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0
0
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0
load('EmoRegBaseline_LStrst.mat')
EmReg_task
1
1
2
3
4
5
4
3
4
5
6
4
-1
f3
4
5
3
53
3
4
3
2
3
4
5
4
-3
2
cd /Volumes/RESEARCH_HD
q   3
4
3
5
5 5
4
5
6
5
4
5
6
4
```

```
3
4
q   2
3
4
3
2
3
4
5
4
5
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5
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-2
3
q   3
2
3
4
5
3
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5
4
3
2
3
4
1
3
2
3
4
5
4
3
2
3
4
5
6
4
3
2
3
%-- 3/28/22, 2:02 PM --%
network_seg_new
addpath(genpath('/Users/dianaperez/Documents/Dependencies/Resources/'))
network_seg_new
within(within<0) = 0;
network_seg_new
mean(within>0)
network_seg_new
between(between<0) = 0;
network_seg_new
mean(within_network)
mean(within_network{:,:,:})
network_seg_new
```

```
network_z.within{sub,ses}(net)
permute_net_assignment
net_size_across_hems
cd '/Users/dianaperez/Documents/GitHub/PerezEtAl_HemAsymmetries'
net_size_across_hems
group_avg.data(26895)
group_avg.data(26764)
newcifti = zeros(1:59412);
newcifti = zeros(1,1:59412);
newcifti = zeros(1,59412);
old_cifti = group_avg.data(brainstructure==1 || brainstructure==2);
old_cifti = group_avg.data(group_avg.brainstructure==1 || group_avg.brainstructure==2);
old_cifti_LH = group_avg.data(group_avg.brainstructure==1);
old_cifti_RH = group_avg.data(group_avg.brainstructure==2);
old_cifti = [old_cifti_LH; old_cifti_RH];
clear old_cifti_LH old_cifti_RH
unique(old_cifti)
newcifti(old_cifti==14) = 14;
template = ft_read_cifti_mod↙
('/Users/dianaperez/Desktop/Research/Lateralization/Spatial_Location/HCP/HCP_newsplitvars↙
_diffMap_afterclustercorrect_allSubs.dtseries.nii');
template.data = newcifti;
ft_write_cifti_mod('/Users/dianaperez/Desktop/Network14only.dtseries.nii', template)
template.data = newcifti';
ft_write_cifti_mod('/Users/dianaperez/Desktop/Network14only.dtseries.nii', template)
old_cifti = group_avg.data(group_avg.brainstructure>0);
old_cifti = [];
old_cifti = group_avg.data(group_avg.brainstructure>0);
group_avg.brainstructure>0
old_cifti = group_avg.data(group_avg.brainstructure>0);
newcifti(group_avg.data==14) = 14;
template.data = newcifti';
ft_write_cifti_mod('/Users/dianaperez/Desktop/Network14only.dtseries.nii', template)
newcifti(group_avg.data==13) = 13;
template.data = newcifti';
ft_write_cifti_mod('/Users/dianaperez/Desktop/Network13only.dtseries.nii', template)
newcifti = zeros(59412,1);
newcifti(group_avg.data==0) = 1;
ft_write_cifti_mod('/Users/dianaperez/Desktop/NonNetworksOnly.dtseries.nii', template)
template.data = newcifti;
ft_write_cifti_mod('/Users/dianaperez/Desktop/NonNetworksOnly.dtseries.nii', template)
template.data = newcifti(1:59412);
ft_write_cifti_mod('/Users/dianaperez/Desktop/NonNetworksOnly.dtseries.nii', template)
newcifti = zeros(59412,1);
newcifti(group_avg.data==0) = 1;
template.data = newcifti(1:59412);
ft_write_cifti_mod('/Users/dianaperez/Desktop/NonNetworksOnly.dtseries.nii', template)
newcifti = zeros(59412,1);
newcifti(group_avg.data==4) = 4;
template.data = newcifti(1:59412);
ft_write_cifti_mod('/Users/dianaperez/Desktop/Network4Only.dtseries.nii', template)
newcifti = zeros(59412,1);
newcifti(group_avg.data==6) = 6;
template.data = newcifti(1:59412);
ft_write_cifti_mod('/Users/dianaperez/Desktop/Network6Only.dtseries.nii', template)
permute_net_assignment
net_size_across_hems
[out_dir out_str '_groupavg_nets_surfarea_scatter.jpg']
%-- 3/31/22, 10:24 AM --%
cd /Users/dianaperez/Documents/GitHub/
```

```
var_freq_size_net
addpath(genpath('/Users/dianaperez/Documents/Dependencies/cifti-matlab-master'))
var_freq_size_net
good_nets_RH = sum(good_nets_RH);
good_nets_LH = sum(good_nets_LH);
means = [good_nets_LH' good_nets_RH'];
bar(1:14, means)
legend('Left Hem', 'Right Hem')
xticks(1:14)
xticklabels(network_names)
clear all
network_seg_new
addpath '/Users/dianaperez/Documents/GitHub/GrattonLab-General-Repo/FCProcess'
network_seg_new
untitled
addpath(genpath('/Users/dianaperez/Documents/Dependencies/cifti-matlab-master'))
untitled
addpath(genpath('/Users/dianaperez/Documents/Dependencies/Resources'))
untitled
size_nets(net)/288
untitled
mean(node_SI)
untitled
rois(1)
rois(end)
test = matrix(rois)
test = matrix(rois,rois)
untitled
mean(node_SI)
untitled
mean(node_SI)
node_SI = [0.57379448,0.42760423,0.40719646,-0.0084462678,-2.2896698,0.39838830,↙
-0.31563443,-1.0662855,-0.026975855,-0.13974182,-1.0860931]
mean(node_SI)
untitled
figure(matrix_orig)
imagesc(matrix_orig)
imagesc(matrix_sorted)
imagesc(matrix_orig)
imagesc(matrix_sorted)
imagesc(matrix_orig,[0 1]); colormap('jet');
imagesc(matrix_sorted,[0 1]); colormap('jet');
figure
imagesc(matrix_orig,[0 1]); colormap('jet');
imagesc(matrix_orig,[0.4 1]); colormap('jet');
imagesc(matrix_orig,[-0.4 1]); colormap('jet');
figure
imagesc(matrix_sorted,[-0.4 1]); colormap('jet');
untitled
skip = net_size(1);
net_size(1) = [];
weights = net_size./(300-skip)
atlas_params.networks{2:e14}
atlas_params.networks{2:14}
untitled
atlas_params.networks{2:14}
network_z.networks{1:13} = atlas_params.networks{2:14}
untitled
maskmat = ones(size(tmp_between));
rois(1):rois(end)
```

```
maskmat(:,rois(1):rois(end)) = 0;
untitled
help reshape
between = reshape(between,length(rois), 300-length(rois));
untitled
clear all
untitled
node_between = between(roi,:);
untitled
mean(within)
untitled
mean(between)
untitled
net_size(1)
net_size(5)
untitled
net
untitled
node_within = tmp_within(roi,:);
node_within(roi) = [];
node_within(node_within<0) = [];
node_mean_within = mean(node_within);
untitled
%-- 4/4/22, 1:24 PM --%
segregation_ind_by_node
addpath '/Users/dianaperez/Documents/GitHub/GrattonLab-General-Repo/FCProcess'
segregation_ind_by_node
mean(within_corrs)
mean(means_within)
mean(between_corrs)
mean(means_between)
segregation_ind_by_node
[output_dir subs(sub) '_seg_index_node.mat']
[output_dir subs{sub} '_seg_index_node.mat']
save([output_dir subs{sub} '_seg_index_node.mat'], 'sub_struct')
segregation_ind_by_node
load('/Users/dianaperez/Desktop/Segregation_Analyses/LS03_seg_index_node.mat')
clear all
load('/Users/dianaperez/Desktop/Segregation_Analyses/LS03_seg_index_node.mat')
ft_read_cifti_mod('/Users/dianaperez/Desktop/sub-LS16_vs_120_avg_corr_LR_cortex_corr.↙
dtseries.nii')
ls16  = ans;
cd /Volumes/Back_Up/
ls
cd  Lifespan
cd /Users/dianaperez/Desktop
cd Research/CNS_analyses/
template = ft_read_cifti_mod('sub-LS02_spCorrMap.dtseries.nii');
template.data = ls16.data;
ft_write_cifti_mod('sub-LS16_spCorrMap.dtseries.nii', template);
%-- 4/7/22, 12:53 PM --%
CreateVariantFiles_LS03specific
addpath(genpath('/Users/dianaperez/Documents/Dependencies/'))
CreateVariantFiles_LS03specific
SNRpath
ft_read_cifti_mod(SNRpath)
CreateVariantFiles_LS03specific
addpath '/Users/dianaperez/Documents/GitHub/Lifespan-Analysis'
CreateVariantFiles_LS03specific
%-- 4/9/22, 11:31 AM --%
```

```
cd /Volumes/RESEARCH_HD
cd /Users/dianaperez/Documents/
reliability_analysis
mean = mean(corr,1);
times =[5:5:100];
figure;
plot(times(1:20),corr(1,1:20),'Color',[1, 0, 0],'LineWidth', 3) %LS02
hold on
plot(times(1:20),corr(2,1:20),'Color',[0, 1, 0],'LineWidth', 3) %LS03
hold on
plot(times(1:20),corr(3,1:20),'Color',[0, 0, 1],'LineWidth', 3)%LS05
hold on
plot(times(1:3),corr(4,1:3),'Color',[0, 1, 1],'LineWidth', 3)%LS08
hold on
plot(times(1:20),corr(5,1:20),'Color',[1, 0, 1],'LineWidth', 3)%LS11
hold on
plot(times(1:20),corr(6,1:20),'Color',[0.4660 0.6740 0.1880],'LineWidth', 3)%LS14
hold on
plot(times(1:20),corr(7,1:9),'Color',[0.9290 0.6940 0.1250],'LineWidth', 3)%LS14
hold on
plot(times(1:20),corr(8,1:14),'Color',[0.4940 0.1840 0.5560],'LineWidth', 3)%LS14
hold on
plot(times(1:20),mean, ':', 'Color', [0,0,0], 'LineWidth',3) %average
close gcf
times =[5:5:100];
figure;
plot(times(1:20),corr(1,1:20),'Color',[1, 0, 0],'LineWidth', 3) %LS02
hold on
plot(times(1:20),corr(2,1:20),'Color',[0, 1, 0],'LineWidth', 3) %LS03
hold on
plot(times(1:20),corr(3,1:20),'Color',[0, 0, 1],'LineWidth', 3)%LS05
hold on
plot(times(1:3),corr(4,1:3),'Color',[0, 1, 1],'LineWidth', 3)%LS08
hold on
plot(times(1:20),corr(5,1:20),'Color',[1, 0, 1],'LineWidth', 3)%LS11
hold on
plot(times(1:20),corr(6,1:20),'Color',[0.4660 0.6740 0.1880],'LineWidth', 3)%LS14
hold on
plot(times(1:20),corr(7,1:9),'Color',[0.9290 0.6940 0.1250],'LineWidth', 3)%LS14
hold on
plot(times(1:20),corr(8,1:14),'Color',[0.4940 0.1840 0.5560],'LineWidth', 3)%LS14
hold on
plot(times(1:20),mean(1:20), ':', 'Color', [0,0,0], 'LineWidth',3) %average
plot(times(1:20),mean(1:20), ':', 'Color', [0,0,0], 'LineWidth',3)
close gcf
times =[5:5:100];
figure;
plot(times(1:20),corr(1,1:20),'Color',[1, 0, 0],'LineWidth', 3) %LS02
hold on
plot(times(1:20),corr(2,1:20),'Color',[0, 1, 0],'LineWidth', 3) %LS03
hold on
plot(times(1:20),corr(3,1:20),'Color',[0, 0, 1],'LineWidth', 3)%LS05
hold on
plot(times(1:3),corr(4,1:3),'Color',[0, 1, 1],'LineWidth', 3)%LS08
hold on
plot(times(1:20),corr(5,1:20),'Color',[1, 0, 1],'LineWidth', 3)%LS11
hold on
plot(times(1:20),corr(6,1:20),'Color',[0.4660 0.6740 0.1880],'LineWidth', 3)%LS14
hold on
plot(times(1:9),corr(7,1:9),'Color',[0.9290 0.6940 0.1250],'LineWidth', 3)%LS14
```

```
hold on
plot(times(1:14),corr(8,1:14),'Color',[0.4940 0.1840 0.5560],'LineWidth', 3)%LS14
hold on
plot(times(1:20),mean(1:20), ':', 'Color', [0,0,0], 'LineWidth',3) %average
mean = [0.580319941 0.671566779 0.723272658 0.757708593 0.778572007 0.788029527↙
0.79889902  0.808729104 0.818726873 0.821323197 0.827748935 0.836636393 0.843602278↙
0.847735413 0.852112674 0.856295884 0.861091436 0.862434778 0.865438688 0.867434122]
close gcf
figure;
plot(times(1:20),corr(1,1:20),'Color',[1, 0, 0],'LineWidth', 3) %LS02
hold on
plot(times(1:20),corr(2,1:20),'Color',[0, 1, 0],'LineWidth', 3) %LS03
hold on
plot(times(1:20),corr(3,1:20),'Color',[0, 0, 1],'LineWidth', 3)%LS05
hold on
plot(times(1:3),corr(4,1:3),'Color',[0, 1, 1],'LineWidth', 3)%LS08
hold on
plot(times(1:20),corr(5,1:20),'Color',[1, 0, 1],'LineWidth', 3)%LS11
hold on
plot(times(1:20),corr(6,1:20),'Color',[0.4660 0.6740 0.1880],'LineWidth', 3)%LS14
hold on
plot(times(1:9),corr(7,1:9),'Color',[0.9290 0.6940 0.1250],'LineWidth', 3)%LS14
hold on
plot(times(1:14),corr(8,1:14),'Color',[0.4940 0.1840 0.5560],'LineWidth', 3)%LS14
hold on
plot(times(1:20),mean(1:20), ':', 'Color', [0,0,0], 'LineWidth',3) %average
ylabel('Pearson Correlation (r)');
xlabel('Time (Minutes)');
m = findobj(gca,'Type','line');
hleg1 = legend(m(1:7), 'Average', 'LS14', 'LS11', 'LS08', 'LS05', 'LS03', 'LS02',↙
'Location', 'SouthEast');
hleg1.FontSize = 14;
ax = gca;
ax.FontSize = 17;
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.5, 0.7, 0.5, 0.7]);
close gcf
figure;
plot(times(1:20),corr(1,1:20),'Color',[1, 0, 0],'LineWidth', 3) %LS02
hold on
plot(times(1:20),corr(2,1:20),'Color',[0, 1, 0],'LineWidth', 3) %LS03
hold on
plot(times(1:20),corr(3,1:20),'Color',[0, 0, 1],'LineWidth', 3)%LS05
hold on
plot(times(1:3),corr(4,1:3),'Color',[0, 1, 1],'LineWidth', 3)%LS08
hold on
plot(times(1:20),corr(5,1:20),'Color',[1, 0, 1],'LineWidth', 3)%LS11
hold on
plot(times(1:20),corr(6,1:20),'Color',[0.4660 0.6740 0.1880],'LineWidth', 3)%LS14
hold on
plot(times(1:9),corr(7,1:9),'Color',[0.9290 0.6940 0.1250],'LineWidth', 3)%LS14
hold on
plot(times(1:14),corr(8,1:14),'Color',[0.4940 0.1840 0.5560],'LineWidth', 3)%LS14
hold on
plot(times(1:20),mean(1:20), ':', 'Color', [0,0,0], 'LineWidth',3) %average
ylabel('Pearson Correlation (r)');
xlabel('Time (Minutes)');
m = findobj(gca,'Type','line');
hleg1 = legend(m(1:9), 'Average', 'LS14', 'LS11', 'LS08', 'LS05', 'LS03', 'LS02',↙
'Location', 'SouthEast');
hleg1.FontSize = 14;
```

```
ax = gca;
ax.FontSize = 17;
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.5, 0.7, 0.5, 0.7]);
close gcf
times =[5:5:100];
figure;
plot(times(1:20),corr(1,1:20),'Color',[1, 0, 0],'LineWidth', 3) %LS02
hold on
plot(times(1:20),corr(2,1:20),'Color',[0, 1, 0],'LineWidth', 3) %LS03
hold on
plot(times(1:20),corr(3,1:20),'Color',[0, 0, 1],'LineWidth', 3)%LS05
hold on
plot(times(1:3),corr(4,1:3),'Color',[0, 1, 1],'LineWidth', 3)%LS08
hold on
plot(times(1:20),corr(5,1:20),'Color',[1, 0, 1],'LineWidth', 3)%LS11
hold on
plot(times(1:20),corr(6,1:20),'Color',[0.4660 0.6740 0.1880],'LineWidth', 3)%LS14
hold on
plot(times(1:9),corr(7,1:9),'Color',[0.9290 0.6940 0.1250],'LineWidth', 3)%LS14
hold on
plot(times(1:14),corr(8,1:14),'Color',[0.4940 0.1840 0.5560],'LineWidth', 3)%LS14
hold on
plot(times(1:20),mean(1:20), ':', 'Color', [0,0,0], 'LineWidth',3) %average
ylabel('Pearson Correlation (r)');
xlabel('Time (Minutes)');
m = findobj(gca,'Type','line');
hleg1 = legend(m(1:9), 'Average', 'LS17', 'LS17', 'LS14', 'LS11', 'LS08', 'LS05', 'LS03',↙
'LS02', 'Location', 'SouthEast');
hleg1.FontSize = 14;
ax = gca;
ax.FontSize = 17;
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.5, 0.7, 0.5, 0.7]);
close gcf
figure;
plot(times(1:20),corr(1,1:20),'Color',[1, 0, 0],'LineWidth', 3) %LS02
hold on
plot(times(1:20),corr(2,1:20),'Color',[0, 1, 0],'LineWidth', 3) %LS03
hold on
plot(times(1:20),corr(3,1:20),'Color',[0, 0, 1],'LineWidth', 3)%LS05
hold on
plot(times(1:3),corr(4,1:3),'Color',[0, 1, 1],'LineWidth', 3)%LS08
hold on
plot(times(1:20),corr(5,1:20),'Color',[1, 0, 1],'LineWidth', 3)%LS11
hold on
plot(times(1:20),corr(6,1:20),'Color',[0.4660 0.6740 0.1880],'LineWidth', 3)%LS14
hold on
plot(times(1:9),corr(7,1:9),'Color',[0.9290 0.6940 0.1250],'LineWidth', 3)%LS14
hold on
plot(times(1:14),corr(8,1:14),'Color',[0.4940 0.1840 0.5560],'LineWidth', 3)%LS14
hold on
plot(times(1:20),mean(1:20), ':', 'Color', [0,0,0], 'LineWidth',3) %average
ylabel('Pearson Correlation (r)');
xlabel('Time (Minutes)');
m = findobj(gca,'Type','line');
hleg1 = legend(m(1:9), 'Average', 'LS17', 'LS16', 'LS14', 'LS11', 'LS08', 'LS05', 'LS03',↙
'LS02', 'Location', 'SouthEast');
hleg1.FontSize = 14;
ax = gca;
ax.FontSize = 17;
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.5, 0.7, 0.5, 0.7]);
```

```
print(gcf,↙
['/Volumes/RESEARCH_HD/Lifespan/CNS_Analyses/ReliabilityLifespanRestDatatruhalf' num2str↙
(pts2sample) '.jpg'],'-dpng','-r300');
similarity_analysis_forced_same_amt_data
matched_data = datasample(masked_data,min_data,2,'Replace', false);
similarity_analysis_forced_same_amt_data
addpath(genpath('/Users/dianaperez/Documents/Dependencies/'))
matcheddata_corrlin(count,:) = single(FisherTransform(corrmat_matched_data(maskmat)));
similarity_analysis_forced_same_amt_data
figure('Position',[1 1 1000 800]);
imagesc(simmat,[0 1]); colormap('jet');
hline_new([5,10,15,20,25,30,35,40]+0.5,'k',2);
hline_new(0,'k',2);
hline_new(0.5,'k',2);
vline_new([0,5,10,15,20,25,30,35,40]+0.5,'k',2);
set(gca,'XTick',[4,13.5,19,24.5,30.5,34,37,40], 'YTick',↙
[4,13.5,19,24.5,30.5,34,37,40,45], 'XTickLabel',...
{'LS02', 'LS03', 'LS04', 'LS05', 'LS07', 'LS08', 'LS10', 'LS11', 'LS14','LS16','LS17'},↙
'YTickLabel', {'LS02', 'LS03', 'LS04', 'LS05', 'LS07', 'LS08', 'LS10', 'LS11', 'LS14'});
set(gca,'XTick',[2.5,7.5,12.5,17.5,22.5,27.5,32.5,37.5], 'YTick',↙
[2.5,7.5,12.5,17.5,22.5,27.5,32.5,37.5], 'XTickLabel',...
{'LS02', 'LS03', 'LS04', 'LS05', 'LS07', 'LS08', 'LS10', 'LS11', 'LS14','LS16','LS17'},↙
'YTickLabel', {'LS02', 'LS03', 'LS04', 'LS05', 'LS07', 'LS08', 'LS10', 'LS11', 'LS14'});
set(gca,'XTick',[3,8,13,18,23,28,33,38], 'YTick', [3,8,13,18,23,28,33,38],↙
'XTickLabel',...
{'LS02', 'LS03', 'LS04', 'LS05', 'LS07', 'LS08', 'LS10', 'LS11', 'LS14','LS16','LS17'},↙
'YTickLabel', {'LS02', 'LS03', 'LS04', 'LS05', 'LS07', 'LS08', 'LS10', 'LS11', 'LS14'});
axis square;
colorbar;
set(gca,'XTick',[3,8,13,18,23,28,33,38], 'YTick', [3,8,13,18,23,28,33,38],↙
'XTickLabel',...
{'LS02', 'LS03', 'LS05', 'LS08', 'LS11', 'LS14','LS16','LS17'}, 'YTickLabel', {'LS02',↙
'LS03', 'LS05', 'LS08', 'LS11', 'LS14','LS16','LS17'});
axis square;
colorbar;
title('Correlation Matrix Similarity');
saveas(gcf,[outDir 'SimilarityMat_rest_matched_data.tiff'],'tiff');
close('all');
figure('Position',[1 1 1000 800]);
imagesc(simmat,[0 1]); colormap('jet');
hline_new([0,5,10,15,20,25,30,35,40]+0.5,'k',2);
vline_new([0,5,10,15,20,25,30,35,40]+0.5,'k',2);
set(gca,'XTick',[3,8,13,18,23,28,33,38], 'YTick', [3,8,13,18,23,28,33,38],↙
'XTickLabel',...
{'LS02', 'LS03', 'LS05', 'LS08', 'LS11', 'LS14','LS16','LS17'}, 'YTickLabel', {'LS02',↙
'LS03', 'LS05', 'LS08', 'LS11', 'LS14','LS16','LS17'});
axis square;
colorbar;
ax = gca;
ax.FontSize = 24;
saveas(gcf,[outDir 'SimilarityMat_rest_matched_data.tiff'],'tiff');
reliability_analysis
mean = [0.580319941 0.671566779 0.723272658 0.757708593 0.778572007 0.788029527↙
0.79889902  0.808729104 0.818726873 0.821323197 0.827748935 0.836636393 0.843602278↙
0.847735413 0.852112674 0.856295884 0.861091436 0.862434778 0.865438688 0.867434122];
hleg1.FontSize = 20;
ax = gca;
ax.FontSize = 24;
hleg1.FontSize = 20;
hleg1.FontSize = 15;
```

```
hleg1.FontSize = 18;
hleg1.FontSize = 16;
hleg1 = legend(m(1:9), 'Mean', 'LS17', 'LS16', 'LS14', 'LS11', 'LS08', 'LS05', 'LS03',↙
'LS02', 'Location', 'SouthEast');
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.5, 0.7, 0.5, 0.7]);
hleg1.FontSize = 20;
ax.FontSize = 24;
hleg1.FontSize = 24;
hleg1.FontSize = 23;
print(gcf,↙
['/Volumes/RESEARCH_HD/Lifespan/CNS_Analyses/ReliabilityLifespanRestDatatruhalf' num2str↙
(pts2sample) '.jpg'],'-dpng','-r300');
similarity_analysis_wLongitudinal
hline_new([8,18,19,29,31,36,37,42,47,53]+0.5,'k',2);
hline_new([8,18,19,29,31,36,37,42,47,52]+0.5,'k',2);
close gcf
figure('Position',[1 1 1000 800]);
imagesc(simmat,[0 1]); colormap('jet');
hline_new([8,18,19,29,31,36,37,42,47,52]+0.5,'k',2);
hline_new([3,13,24]+0.5,'k',.5);
vline_new([8,18,19,29,31,36,37,42, 47,52]+0.5,'k',2);
vline_new([3,13,24]+0.5,'k',.5);
set(gca,'XTick',[4,13.5,19,24.5,30.5,34,37,40,45, 50], 'YTick',↙
[4,13.5,19,24.5,30.5,34,37,40,45,50], 'XTickLabel',...
{'LS02', 'LS03', 'LS04', 'LS05', 'LS07', 'LS08', 'LS10', 'LS11', 'LS14', 'LS16', 'LS17'},↙
'YTickLabel', {'LS02', 'LS03', 'LS04', 'LS05', 'LS07', 'LS08', 'LS10', 'LS11', 'LS14',↙
'LS16', 'LS17'});
axis square;
colorbar;
set(gca,'XTick',[2,13.5,19,24.5,30.5,34,37,40,45, 50, 55], 'YTick',↙
[4,13.5,19,24.5,30.5,34,37,40,45,50, 55], 'XTickLabel',...
{'LS02', 'LS03', 'LS04', 'LS05', 'LS07', 'LS08', 'LS10', 'LS11', 'LS14', 'LS16', 'LS17'},↙
'YTickLabel', {'LS02', 'LS03', 'LS04', 'LS05', 'LS07', 'LS08', 'LS10', 'LS11', 'LS14',↙
'LS16', 'LS17'});
axis square;
colorbar;
ax = gca;
ax.FontSize = 24;
ax.FontSize = 20;
subs = {'LS02', 'LS03', 'LS05'};
sessions = [8,10,10];
clear corrmat
count = 1;
for sub = 1:numel(subs)
for ses = 1:sessions(sub)
data = load(sprintf('%s/sub-%s/sub-%s_sess-%d_task-rest_corrmat_Seitzman300.mat',↙
datadir, subs{sub}, subs{sub}, ses));
corrmat(count,:,:,:) =  data.corrmat;
%          sub_corrmat(ses,:,:,:) = data.corrmat;
count = count + 1;
end
end
clear corrlin
maskmat = ones(atlas_params.num_rois);
maskmat = logical(triu(maskmat,1));
count = 1;
for sub = 1:numel(subs)
for ses = 1:sessions(sub)
tmp = corrmat(count,:,:,:);
if fisher
```

```
corrlin(count,:) = single(FisherTransform(tmp(maskmat)));
else
corrlin(count,:) = single(tmp(maskmat));
end
count = count + 1;
end
end
simmat = corr(corrlin');
figure('Position',[1 1 1000 800]);
imagesc(simmat,[0 1]); colormap('jet');
hline_new([8,18]+0.5,'k',2);
hline_new([3,13,23]+0.5,'k',.5);
vline_new([8,18]+0.5,'k',2);
vline_new([3,13,23]+0.5,'k',.5);
set(gca,'XTick',[4,13.5,23.5], 'YTick', [4,13.5,23.5], 'XTickLabel',...
{'LS02', 'LS03', 'LS05'}, 'YTickLabel', {'LS02', 'LS03', 'LS05'});
axis square;
colorbar;
ax = gca;
ax.FontSize = 20;
ax.FontSize = 24;
saveas(gcf,[outDir 'SimilarityMat_longitudinalSubs.tiff'],'tiff');
close('all');
ses_pre = [3,5,5];
ses_post = [5,5,5];
count = 1;
clear corrmat
for sub = 1:numel(subs)
for ses = 1:ses_pre(sub)
data = load(sprintf('%s/sub-%s/sub-%s_sess-%d_task-rest_corrmat_Seitzman300.mat',↙
datadir, subs{sub}, subs{sub}, ses));
corrmat(count,:,:,:) =  data.corrmat;
sub_corrmat(ses,:,:,:) = data.corrmat;
count = count + 1;
end
if ses > 1
mean_pre(sub,:,:,:) = squeeze(mean(sub_corrmat));
clear sub_corrmat
else
mean_pre(sub,:,:,:)= squeeze(sub_corrmat);
end
end
count = 1;
for sub = 1:numel(subs)
for ses = ses_pre(sub)+1:ses_pre(sub)+ses_post(sub)
data = load(sprintf('%s/sub-%s/sub-%s_sess-%d_task-rest_corrmat_Seitzman300.mat',↙
datadir, subs{sub}, subs{sub}, ses));
corrmat(count,:,:,:) =  data.corrmat;
sub_corrmat(ses,:,:,:) = data.corrmat;
count = count + 1;
end
if ses > 1
mean_post(sub,:,:,:) = squeeze(mean(sub_corrmat));
clear sub_corrmat
else
mean_post(sub,:,:,:)= squeeze(sub_corrmat);
end
end
maskmat = ones(atlas_params.num_rois);
maskmat = logical(triu(maskmat,1));
```

```
clear corrlin
count = 1;
for sub = 1:numel(subs)
tmp = mean_pre(count,:,:,:);
corrlin_pre(count,:) = single(tmp(maskmat));
tmp = mean_post(count,:,:,:);
corrlin_post(count,:) = single(tmp(maskmat));
count = count + 1;
end
simmat = corr(corrlin_pre', corrlin_post');
figure('Position',[1 1 1000 800]);
imagesc(simmat,[0 1]); colormap('jet');
hline_new([1:2]+0.5,'k',2);
vline_new([1:2]+0.5,'k',2);
set(gca,'XTick',[1:3], 'YTick', [1:3], 'XTickLabel',...
{'LS02', 'LS03', 'LS05'}, 'YTickLabel', {'LS02', 'LS03', 'LS05'});
axis square;
ax = gca;
ax.FontSize = 24;
colorbar;
ax.FontSize = 24;
ax = gca;
ax.FontSize = 24;
xtitle('Timepoint A')
title('Similarity Across Sessions ~1 year apart')
xlabel('Timepoint A')
xlabel('Timepoint B')
ylabel('Timepoint A')
saveas(gcf,[outDir 'SimilarityMat_longitudinal_avg.tiff'],'tiff');
segregation_ind_by_net
help ones
segregation_ind_by_net
help sum
segregation_ind_by_net
weights(net)
seg_index_net(net,ses)
weights(net)
seg_index_net(net,ses)
weights(net)*seg_index_net(net,ses)
segregation_ind_by_net
seg_index_net(15,:) = sum(weighted_seg_ind_net);
segregation_ind_by_net
segregation_ind_by_ses
segregation_ind_by_sub
mean_matrix = mean_matrix(:,300,300);
segregation_ind_by_sub
mean = mean_matrix(:,:,:);
mean = mean_matrix(1,:,:);
mean = squeeze(mean_matrix);
mean_matrix(:,:,:) = squeeze(mean(sub_corrmat));
mean_matrix = squeeze(mean(sub_corrmat));
segregation_ind_by_sub
segregation_ind_by_net
load('/Users/dianaperez/Desktop/Segregation_Analyses/allsubs_seg_index_sub.mat')
clear all
load('/Users/dianaperez/Desktop/Segregation_Analyses/allsubs_seg_index_sub.mat')
segregation_ind_by_sub
load('/Users/dianaperez/Desktop/Segregation_Analyses/allsubs_seg_index_ses.mat')
clear all
load('/Users/dianaperez/Desktop/Segregation_Analyses/allsubs_seg_index_ses.mat')
```

```
segregation_ind_by_sub
segregation_ind_by_ses
load('/Users/dianaperez/Desktop/Segregation_Analyses/LS02_seg_index_net.mat')
clear all
load('/Users/dianaperez/Desktop/Segregation_Analyses/LS02_seg_index_net.mat')
load('/Users/dianaperez/Desktop/Segregation_Analyses/LS03_seg_index_net.mat')
load('/Users/dianaperez/Desktop/Segregation_Analyses/LS05_seg_index_net.mat')
load('/Users/dianaperez/Desktop/Segregation_Analyses/LS08_seg_index_net.mat')
load('/Users/dianaperez/Desktop/Segregation_Analyses/LS11_seg_index_net.mat')
load('/Users/dianaperez/Desktop/Segregation_Analyses/LS14_seg_index_net.mat')
load('/Users/dianaperez/Desktop/Segregation_Analyses/LS16_seg_index_net.mat')
load('/Users/dianaperez/Desktop/Segregation_Analyses/LS17_seg_index_net.mat')
segregation_ind_by_node
load('/Users/dianaperez/Desktop/Segregation_Analyses/allsubs_seg_index_ses.mat')
clear all
load('/Users/dianaperez/Desktop/Segregation_Analyses/allsubs_seg_index_ses.mat')
similarity_analysis
.3855-.3762
help reshape
similarity_analysis
40*40
similarity_analysis
help reshape
similarity_analysis
figure('Position',[1 1 1000 800]);
imagesc(matrix,[0 1]); colormap('jet');
min(matrix)
min(min(matrix)
min(min(matrix))
max(max(matrix))
min(diff_score)
max(diff_score)
close all
figure('Position',[1 1 1000 800]);
imagesc(matrix,[0 .2]); colormap('jet');
colorbar
imagesc(matrix,[0 .01]); colormap('jet');
imagesc(matrix,[0 .1]); colormap('jet');
imagesc(matrix,[-.2 .2]); colormap('jet');
imagesc(matrix,[-.15 .15]); colormap('jet');
imagesc(matrix,[-.14 .14]); colormap('jet');
abs(matrix)
close all
figure('Position',[1 1 1000 800]);
imagesc(matrix,[-.14 .14]); colormap('jet');
matrix = abs(diff_score);
matrix = reshape(matrix, [40,40]);
figure('Position',[1 1 1000 800]);
imagesc(matrix,[0 .14]); colormap('jet');
colorbar
imagesc(matrix,[0 .1]); colormap('jet');
imagesc(matrix,[0 .14]); colormap('jet');
colorbar
hline_new([0,5,10,15,20,25,30,35,40]+0.5,'k',2);
vline_new([0,5,10,15,20,25,30,35,40]+0.5,'k',2);
set(gca,'XTick',[3,8,13,18,23,28,33,38], 'YTick', [3,8,13,18,23,28,33,38],↙
'XTickLabel',...
{'LS02', 'LS03', 'LS05', 'LS08', 'LS11', 'LS14','LS16','LS17'}, 'YTickLabel', {'LS02',↙
'LS03', 'LS05', 'LS08', 'LS11', 'LS14','LS16','LS17'});
axis square;
```

```
FT_matrix = FisherTransform(matrix);
max(FT_matrix)
max(max(FT_matrix))
figure('Position',[1 1 1000 800]);
imagesc(matrix,[0 .14]); colormap('jet');
imagesc(FT_matrix,[0 .14]); colormap('jet');
hline_new([0,5,10,15,20,25,30,35,40]+0.5,'k',2);
vline_new([0,5,10,15,20,25,30,35,40]+0.5,'k',2);
set(gca,'XTick',[3,8,13,18,23,28,33,38], 'YTick', [3,8,13,18,23,28,33,38],↙
'XTickLabel',...
{'LS02', 'LS03', 'LS05', 'LS08', 'LS11', 'LS14','LS16','LS17'}, 'YTickLabel', {'LS02',↙
'LS03', 'LS05', 'LS08', 'LS11', 'LS14','LS16','LS17'});
axis square;
colorbar;
close all
similarity_analysis
run('/Users/dianaperez/Documents/GitHub/Lifespan-↙
Analysis/Segregation_Index/segregation_ind_by_node.m')
%-- 4/10/22, 4:51 PM --%
CreateVariantFiles_LS03specific
addpath '/Users/dianaperez/Documents/Dependencies/cifti-matlab-master'
CreateVariantFiles_LS03specific
ft_read_cifti_mod('/Volumes/RESEARCH_HD/Lifespan/CNS_analyses/spCor_Maps/sub-LS17_first-↙
half_vs_120_avg_corr_LR_cortex_corr.dtseries.nii')
ft_read_cifti_mod('/Volumes/RESEARCH_HD/Lifespan/CNS_analyses/spCor_Maps/sub-↙
LS03_vs_120_avg_corr_LR_cortex_corr.dtseries.nii')
readtable('/Volumes/fsmresfiles/PBS/Gratton_Lab/Lifespan/Post-↙
COVID/BIDS/derivatives/preproc_fmriprep-20.2.0/fmriprep/sub-LS02/ses-↙
5/func/FD_outputs/sub-LS02_ses-5_task-rest_desc-framenums_fFD.txt')
clear all
readtable('/Volumes/fsmresfiles/PBS/Gratton_Lab/Lifespan/Post-↙
COVID/BIDS/derivatives/preproc_fmriprep-20.2.0/fmriprep/sub-LS02/ses-↙
5/func/FD_outputs/sub-LS02_ses-5_task-rest_desc-framenums_fFD.txt')
mean(ans)
Var1 = ans{:,1};
mean(Var1);
get_FDnums
CreateVariantFiles_LS03specific
similarity_analysis
hline_new([0,5,10,15,20,25,30,35,40]+0.5,'k',2);
vline_new([0,5,10,15,20,25,30,35,40]+0.5,'k',2);
set(gca,'XTick',[3,8,13,18,23,28,33,38], 'YTick', [3,8,13,18,23,28,33,38],↙
'XTickLabel',...
{'LS02', 'LS03', 'LS05', 'LS08', 'LS11', 'LS14','LS16','LS17'}, 'YTickLabel', {'LS02',↙
'LS03', 'LS05', 'LS08', 'LS11', 'LS14','LS16','LS17'});
axis square;
colorbar;
addpath '/Users/dianaperez/Documents/GitHub/Lifespan-Analysis'
hline_new([0,5,10,15,20,25,30,35,40]+0.5,'k',2);
vline_new([0,5,10,15,20,25,30,35,40]+0.5,'k',2);
set(gca,'XTick',[3,8,13,18,23,28,33,38], 'YTick', [3,8,13,18,23,28,33,38],↙
'XTickLabel',...
{'LS02', 'LS03', 'LS05', 'LS08', 'LS11', 'LS14','LS16','LS17'}, 'YTickLabel', {'LS02',↙
'LS03', 'LS05', 'LS08', 'LS11', 'LS14','LS16','LS17'});
axis square;
colorbar;
saveas(gcf,[outDir 'SimilarityMat_SegregationIndex.tiff'],'tiff');
outDir = '/Users/dianaperez/Desktop/Segregation_Analyses';
saveas(gcf,[outDir 'SimilarityMat_SegregationIndex.tiff'],'tiff');
CreateVariantFiles_LS03specific
```

```
variant_overlap2
ft_write_cifti([out_dir subs{sub} '_variant_overlap_split-half.dtseries.nii'], template)
variant_overlap2
ft_write_cifti_mod(out_fname, template)
variant_overlap2
mean(corrs)
subs = {'LS02', 'LS03', 'LS05', 'LS08', 'LS11', 'LS14', 'LS16', 'LS17'};
data_dir = '/Volumes/RESEARCH_HD/Lifespan/CNS_analyses/spCor_Maps/split-half/';
out_dir = '/Volumes/RESEARCH_HD/Lifespan/CNS_analyses/';
corrs = [];
for sub = 1:numel(subs)
map1 = ft_read_cifti_mod([data_dir 'sub-' subs{sub} '_first-↙
half_vs_120_avg_corr_LR_cortex_corr.dtseries.nii']);
map2 = ft_read_cifti_mod([data_dir 'sub-' subs{sub} '_second-↙
half_vs_120_avg_corr_LR_cortex_corr.dtseries.nii']);
corrs(sub) = corr(map1.data, map2.data);
end
subs = {'LS02', 'LS03', 'LS05', 'LS08', 'LS11', 'LS14', 'LS16', 'LS17'};
data_dir = '/Volumes/RESEARCH_HD/Lifespan/CNS_analyses/spCor_Maps/split-half/';
out_dir = '/Volumes/RESEARCH_HD/Lifespan/CNS_analyses/';
corrs = [];
for sub1 = 1:numel(subs)
for sub2 = 1:numer(subs)
map1 = ft_read_cifti_mod([data_dir 'sub-' subs{sub1} '_first-↙
half_vs_120_avg_corr_LR_cortex_corr.dtseries.nii']);
map2 = ft_read_cifti_mod([data_dir 'sub-' subs{sub2} '_second-↙
half_vs_120_avg_corr_LR_cortex_corr.dtseries.nii']);
corrs(sub1,sub2) = corr(map1.data, map2.data);
end
splithalf_spcorrmap_simmat
figure('Position',[1 1 1000 800]);
imagesc(corrs,[0 1]); colormap('jet');
%hline_new([0,5,10,15,20,25,30,35,40]+0.5,'k',2);
%vline_new([0,5,10,15,20,25,30,35,40]+0.5,'k',2);
set(gca,'XTick',[1:8], 'YTick', [1:8], 'XTickLabel',...
{'LS02', 'LS03', 'LS05', 'LS08', 'LS11', 'LS14','LS16','LS17'}, 'YTickLabel', {'LS02',↙
'LS03', 'LS05', 'LS08', 'LS11', 'LS14','LS16','LS17'});
axis square;
colorbar;
hline_new([1:8]+0.5,'k',2);
vline_new([1:8]+0.5,'k',2);
hline_new([0:8]+0.5,'k',2);
vline_new([0:8]+0.5,'k',2);
ax =gca;
ax.FontSize = 24
saveas(gcf,[out_dir 'SimilarityMat_SpCorrMap.tiff'],'tiff');
similarity_analysis_forced_same_amt_data
for s = 1:numel(subject)
lines = [count:(count+sessions-1)]
sub_vals = simmat(lines,:);
maskmat = zeros(sessions,sessions)'
count = count+sessions;
end
similarity_analysis_forced_same_amt_data
maskmat = logical(triu(maskmat, 1));
maskmat = ones(sessions,sessions);
maskmat = logical(triu(maskmat, 1));
count = 1;
within = [];
between = [];
```

```
for s = 1:numel(subject)
lines = [count:(count+sessions-1)];
sub_vals = simmat(lines,:);
maskmat = ones(sessions,sessions);
maskmat = logical(triu(maskmat, 1));
within_sub = sub_vals(lines,lines);
within = [within; within_sub(maskmat)];
maskmat = ones(size(sub_vals));
maskmat(lines,lines) = 0;
between = [between; sub_vals(maskmat==1)];
count = count+sessions;
end
delete_this
mean(within)
mean(between)
similarity_analysis_wLongitudinal
clear all
segregation_ind_by_sub
segregation_ind_by_node
CreateVariantFiles_LS03specific
overlapmap
unique(group_map)
ft_write_cifti_mod([out_dir '/Lifespan_Variant_Overlap_Map.dtseries.nii'], overlap_map);
segregation_ind_by_ses_longitudinal
%-- 4/12/22, 2:49 PM --%
CreateVariantFiles_LS03specific
addpath '/Users/dianaperez/Documents/Dependencies/cifti-matlab-master'
CreateVariantFiles_LS03specific
rest_file
CreateVariantFiles_LS03specific
rest_file
outfilerest
CreateVariantFiles_LS03specific
variant_overlap2
[data_dir subs{sub} '_allsess_uniqueIDs_variants_sizeExcluded_thresh-5_smooth_2.55.↙
dtseries.nii']
['/Users/dianaperez/Desktop/' subs{sub}↙
'_allsess_timeA_uniqueIDs_variants_sizeExcluded_thresh-5_smooth_2.55.dtseries.nii']
out_fname
mean([0.292185810351499,0.567052791491455,0.388237057287416])
clear all
load('/Volumes/RESEARCH_HD/Lifespan/CNS_analyses/allsubs_seg_index_ses_longitudinal.mat')
LS02_pre = ses_SI(1,1:3);
LS03_pre = ses_SI(2,1:5);
LS05_pre = ses_SI(3,1:5);
LS02_post = ses_SI(1,4:8);
LS03_post = ses_SI(2,6:10);
LS05_post = ses_SI(3,6:10);
vals = [LS02_pre LS02_post LS03_pre LS03_post LS05_pre LS05_post];
corr(vals)
for val1 = 1:length(vals)
for val2 = 1:length(vals)
diff = abs(val1-val2);
end
end
for val1 = 1:length(vals)
for val2 = 1:length(vals)
diff(val1,val2) = abs(val1-val2);
end
end
```

```
for val1 = 1:length(vals)
for val2 = 1:length(vals)
diff(val1,val2) = abs(vals(val1)-vals(val2));
end
end
figure('Position',[1 1 1000 800]);
imagesc(diff,[0 .14]); colormap('jet');
max(diff)
max(max(diff)
max(max(diff))
imagesc(diff,[0 .12]); colormap('jet');
colorbar;
axis square;
hline_new([0,8,18,28]+0.5,'k',2);
vline_new([0,8,18,28]+0.5,'k',2);
set(gca,'XTick',[4, 13, 23], 'YTick',[4, 13, 23], 'XTickLabel',...
{'LS02', 'LS03', 'LS05'}, 'YTickLabel', {'LS02', 'LS03', 'LS05'});
ax = gca;
ax.FontSize = 24;
hline_new([3,13,23]+0.5,'k',.5);
vline_new([3,13,23]+0.5,'k',.5);
saveas(gcf,[output_dir 'SimilarityMat_SegregationIndex_Longitudinal.tiff'],'tiff');
output_dir = '/Volumes/RESEARCH_HD/Lifespan/CNS_analyses/';
saveas(gcf,[output_dir 'SimilarityMat_SegregationIndex_Longitudinal.tiff'],'tiff');
help scatter
scatter([1,1,1,1,1;2,2,2,2,2], [.1,.2,.6,.2,.1;.5,.6.,.5,.6.,5])
scatter([1,1,1,1,1;2,2,2,2,2], [.1,.2,.6,.2,.1;.5,.6,.5,.6.,5])
scatter([1,1,1,1,1;2,2,2,2,2], [.1,.2,.6,.2,.1;.5,.6,.5,.6,.5])
scatter([1,1,1,1,1], [.1,.2,.6,.2,.1])
scatter([1,1,1,1,1], [.1,.2,.6,.2,.1], 'filled')
clear all
rgb_colors = [1, 0, 0;0, 1, 0;...
0, 0, 1,...
0, 1, 1,...
1, 0, 1,...
0.4660 0.6740 0.188,...
0.9290 0.6940 0.1250,...
0.4940 0.1840 0.5560];
rgb_colors = [1 0 0;
0, 1, 0;
0, 0, 1,
0, 1, 1,
1, 0, 1,
0.4660 0.6740 0.188,
0.9290 0.6940 0.1250,
0.4940 0.1840 0.5560];
load('/Users/dianaperez/Desktop/Segregation_Analyses/allsubs_seg_index_ses.mat')
segregation_ind_by_ses
addpath '/Users/dianaperez/Documents/GitHub/GrattonLab-General-Repo/FCProcess'
segregation_ind_by_ses
within_sub_reliability
test = randperm(catData);
test = randperm(1,catData);
help randperm
test = randperm(1:size(catData));
test = randperm(1:size(catData,1));
size(catData,1)
size(catData,2)
test = 1:size(catData,2);
test = randperm(size(catData,2));
```

```
within_sub_reliability
sampledDatas{t} = datasample(rest_of_data,sampStep*t,2);
within_sub_reliability
size(allsubs_seg_ind{1})
size(allsubs_seg_ind{1},2)
allsubs_seg_ind{1,1}
size(allsubs_seg_ind{1},2)
times =[2.5:2.5:100];
figure;
for s = 1:numel(subs)
plot(times(1:size(allsubs_seg_ind{1},2)),allsubs_seg_ind{1,1},'Color',rgb_color↙
(s,:),'LineWidth', 3)
hold on
end
times =[2.5:2.5:100];
figure;
for s = 1:numel(subject)
plot(times(1:size(allsubs_seg_ind{1},2)),allsubs_seg_ind{1,1},'Color',rgb_color↙
(s,:),'LineWidth', 3)
hold on
end
within_sub_reliability
plot(times(1:size(allsubs_seg_ind{1},2)),allsubs_seg_ind{1,1},'Color',rgb_color↙
(s,:),'LineWidth', 3)
times(1:size(allsubs_seg_ind{1},2))
size(allsubs_seg_ind{1},2)
times(s, 1:size(allsubs_seg_ind{1},2))
times_all(s, 1:size(allsubs_seg_ind{1},2))
plot(times_all(s,1:size(allsubs_seg_ind{1},2)),allsubs_seg_ind{1,1},'Color',rgb_color↙
(s,:),'LineWidth', 3)
plot(times_all(s,1:size(allsubs_seg_ind{1},2)),allsubs_seg_ind{1,1},'Color',rgb_colors↙
(s,:),'LineWidth', 3)
figure;
for s = 1:numel(subject)
plot(times_all(s,1:size(allsubs_seg_ind{1},2)),allsubs_seg_ind{1,1},'Color',rgb_colors↙
(s,:),'LineWidth', 3)
hold on
end
within_sub_reliability
xlabel('Time (Minutes)');
ylabel('Segregation Index');
xlabel('Time (Minutes)');
ylabel('Segregation Index');
xlabel('Time (Minutes)');
m = findobj(gca,'Type','line');
hleg1 = legend(m(1:8), 'LS17', 'LS16', 'LS14', 'LS11', 'LS08', 'LS05', 'LS03', 'LS02',↙
'Location', 'SouthEast');
hleg1.FontSize = 20;
ax = gca;
ax.FontSize = 24;
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.5, 0.7, 0.5, 0.7]);
%
figure;
for s = 1:numel(subject)
plot(times_all(s,1:size(allsubs_seg_ind{s},2)),smooth(allsubs_seg_ind{1,s}),'Color',↙
rgb_colors(s,:),'LineWidth', 3)
hold on
end
%-- 4/12/22, 9:31 PM --%
within_sub_reliability
```

```
addpath '/Users/dianaperez/Documents/GitHub/GrattonLab-General-Repo/FCProcess'
within_sub_reliability
addpath '/Users/dianaperez/Documents/GitHub/Lifespan-Analysis'
within_sub_reliability
%-- 4/12/22, 10:24 PM --%
within_sub_reliability
addpath '/Users/dianaperez/Documents/GitHub/GrattonLab-General-Repo/FCProcess'
within_sub_reliability
help smooth
within_sub_reliability
help axis
axis([0 100 0 .15])
print(gcf,['/Volumes/RESEARCH_HD/Lifespan/CNS_Analyses/ReliabilityLifespanSegIndex.↙
jpg'],'-dpng','-r300');
similarity_analysis_forced_same_amt_data
ax = gca;
ax.FontSize = 24;
saveas(gcf,[outDir 'SimilarityMat_rest.tiff'],'tiff');
close('all');
count = 1;
within = [];
between = [];
for s = 1:numel(subject)
lines = [count:(count+sessions-1)];
sub_vals = simmat(lines,:);
maskmat = ones(sessions,sessions);
maskmat = logical(triu(maskmat, 1));
within_sub = sub_vals(:,lines);
within = [within; within_sub(maskmat)];
maskmat = ones(size(sub_vals));
maskmat(:,lines) = 0;
between = [between; sub_vals(maskmat==1)];
count = count+sessions;
end
mean(between)
mean(within)
similarity_analysis_forced_same_amt_data
rgb_colors = [1 0 0;%LS02
0, 1, 0;%LS03
0, 0, 1;%LS05
0, 1, 1;%LS08
1, 0, 1;%LS11
0.4660 0.6740 0.188;%LS14
0.9290 0.6940 0.1250;%LS16
0.4940 0.1840 0.5560;%LS17
0 0 0;
0 0 0;
0 0 0;
0 0 0;
0 0 0;
0 0 0;
0 0 0;
0 0 0;
0 0 0;
0 0 0];
subs = {'LS02', 'LS03', 'LS05', 'LS08', 'LS11', 'LS14',↙
'LS16','LS17','INET001','INET002',↙
'INET003','INET005','INET006','INET010','INET016','INET018','INET019','INET030'};
lifespan_SI = load('/Users/dianaperez/Desktop/Segregation_Analyses/allsubs_seg_index_ses.↙
mat');
```

```
iNet_SI =  load↙
('/Users/dianaperez/Desktop/Segregation_Analyses/INET_allsubs_seg_index_ses.mat');
handles = plotSpread([Lifespan_SI iNet_SI], 'distributionColors', rgb_for_plot',↙
'xNames', subs)
handles = plotSpread([lifespan_SI iNet_SI], 'distributionColors', rgb_for_plot',↙
'xNames', subs)
handles = plotSpread([lifespan_SI iNet_SI], 'distributionColors', rgb_colors', 'xNames',↙
subs)
for n = 1:numel(network_names)
rgb_for_plot{n} = rgb_colors(n,:);
end
rgb_colors = [1 0 0;%LS02
0, 1, 0;%LS03
0, 0, 1;%LS05
0, 1, 1;%LS08
1, 0, 1;%LS11
0.4660 0.6740 0.188;%LS14
0.9290 0.6940 0.1250;%LS16
0.4940 0.1840 0.5560;%LS17
0 0 0;
0 0 0;
0 0 0;
0 0 0;
0 0 0;
0 0 0;
0 0 0;
0 0 0;
0 0 0;
0 0 0];
subs = {'LS02', 'LS03', 'LS05', 'LS08', 'LS11', 'LS14',↙
'LS16','LS17','INET001','INET002',↙
'INET003','INET005','INET006','INET010','INET016','INET018','INET019','INET030'};
for n = 1:numel(subs)
rgb_for_plot{n} = rgb_colors(n,:);
end
handles = plotSpread([lifespan_SI iNet_SI], 'distributionColors', rgb_for_plot',↙
'xNames', subs)
rgb_colors = [1 0 0;%LS02
0, 1, 0;%LS03
0, 0, 1;%LS05
0, 1, 1;%LS08
1, 0, 1;%LS11
0.4660 0.6740 0.188;%LS14
0.9290 0.6940 0.1250;%LS16
0.4940 0.1840 0.5560;%LS17
0 0 0;
0 0 0;
0 0 0;
0 0 0;
0 0 0;
0 0 0;
0 0 0;
0 0 0;
0 0 0;
0 0 0];
subs = {'LS02', 'LS03', 'LS05', 'LS08', 'LS11', 'LS14',↙
'LS16','LS17','INET001','INET002',↙
'INET003','INET005','INET006','INET010','INET016','INET018','INET019','INET030'};
for n = 1:numel(subs)
rgb_for_plot{n} = rgb_colors(n,:);
```

```
end
load('/Users/dianaperez/Desktop/Segregation_Analyses/allsubs_seg_index_ses.mat');
lifespan_SI = ses_SI;
load('/Users/dianaperez/Desktop/Segregation_Analyses/INET_allsubs_seg_index_ses.mat');
iNet_SI =  ses_SI;
handles = plotSpread([lifespan_SI iNet_SI], 'distributionColors', rgb_for_plot',↙
'xNames', subs)
handles = plotSpread([lifespan_SI' iNet_SI'], 'distributionColors', rgb_for_plot',↙
'xNames', subs)
[lifespan_SI' iNet_SI']
make_figures
handles = plotSpread([lifespan_SI'], 'distributionColors', rgb_for_plot', 'xNames', subs)
make_figures
clear rgb_for_plot
rgb_colors = [1 0 0;%LS02
0, 1, 0;%LS03
0, 0, 1;%LS05
0, 1, 1;%LS08
1, 0, 1;%LS11
0.4660 0.6740 0.188;%LS14
0.9290 0.6940 0.1250;%LS16
0.4940 0.1840 0.5560];%LS17
%             0 0 0;
%             0 0 0;
%             0 0 0;
%             0 0 0;
%             0 0 0;
%             0 0 0;
%             0 0 0;
%             0 0 0;
%             0 0 0;
%             0 0 0];
subs = {'LS02', 'LS03', 'LS05', 'LS08', 'LS11', 'LS14',↙
'LS16','LS17'};%,'INET001','INET002',↙
'INET003','INET005','INET006','INET010','INET016','INET018','INET019','INET030'};
for n = 1:numel(subs)
rgb_for_plot{n} = rgb_colors(n,:);
end
make_figures
ax = gca;
ax.FontSize = 24;
handles = plotSpread([lifespan_SI'], 'categoryMarkers', '.', 'distributionColors',↙
rgb_for_plot', 'xNames', subs)
help plot
handles = plotSpread([lifespan_SI'], 'categoryMarkers', '.', 'distributionColors',↙
rgb_for_plot', 'xNames', subs)
iNet_SI =  ses_SI;
iNet_SI(5,:) = -1;
iNet_SI =  ses_SI';
iNet_SI(5,:) = -1;
SIs = [lifespan_SI' iNetSI];
SIs = [lifespan_SI' iNet_SI];
make_figures
axis([0 18 .25 .6])
axis([0 19 .25 .6])
make_figures
ax = gca;
ax.FontSize = 20;
make_figures
axis([0 19 .25 .6])
```

```
ax = gca;
ax.FontSize = 20;
make_figures
help plot
handles = plotSpread(SIs, 'distributionMarkers', 'o', 'distributionColors',↙
rgb_for_plot', 'xNames', subs)
make_figures
plotSpread
make_figures
rgb_colors = [1 0 0;%LS02
0, 1, 0;%LS03
0, 0, 1;%LS05
0, 1, 1;%LS08
1, 0, 1;%LS11
0.4660 0.6740 0.188;%LS14
0.9290 0.6940 0.1250;%LS16
0.4940 0.1840 0.5560;%LS17
0 0 0;
0 0 0;
0 0 0;
0 0 0;
0 0 0;
0 0 0;
0 0 0;
0 0 0;
0 0 0;
0 0 0];
make_figures
load('/Volumes/RESEARCH_HD/Lifespan/CNS_analyses/allsubs_seg_index_ses_longitudinal.mat')
make_figures
axis([0 19 .25 .6])
handles.MarkerFaceColor
handles
make_figures
axis([0 19 .25 .6])
ax = gca;
ax.FontSize = 20;
load('/Volumes/RESEARCH_HD/Lifespan/CNS_analyses/allsubs_seg_index_ses_longitudinal.mat')
longitudinal_SI = ses_SI;
rgb_colors = [1 0 0;%LS02
0, 1, 0;%LS03
0, 0, 1];%LS05
for n = 1:3
rgb_for_plot{n} = rgb_colors(n,:);
end
handles = plotSpread([lifespan_SI' iNet_SI], 'distributionMarkers', {'x'},↙
'distributionColors', rgb_for_plot')
handles = plotSpread(longitudinal_SI', 'distributionMarkers', {'x'},↙
'distributionColors', rgb_for_plot')
clear rgb_for_plot
rgb_colors = [1 0 0;%LS02
0, 1, 0;%LS03
0, 0, 1];%LS05
for n = 1:3
rgb_for_plot{n} = rgb_colors(n,:);
end
handles = plotSpread(longitudinal_SI', 'distributionMarkers', {'x'},↙
'distributionColors', rgb_for_plot')
close all
make_figures
```

```
clear rgb_for_plot
make_figures
longitudinal_SI(:,6:10) = [];
longitudinal_SI(1,4:5) = -1;
make_figures
plotSpread
make_figures
%-- 4/13/22, 9:50 AM --%
make_figures
axis([0 19 .3 .55])
axis([0 19 .31 .54])
axis([0 19 .32 .53])
axis([0 19 .3 .55])
similarity_analysis
addpath '/Users/dianaperez/Documents/GitHub/Lifespan-Analysis'
similarity_analysis
hline_new([0,4,8,12,16,20,24,28,32]+0.5,'k',2);
vline_new([0,4,8,12,16,20,24,28,32]+0.5,'k',2);
vline_new([0,4,8,12,16,20,24,28,32,36,40]+0.5,'k',2);
hline_new([0,4,8,12,16,20,24,28,32,36,40]+0.5,'k',2);
axis square;
colorbar;
SIs = [0.40465483 0.47502443 0.42045888 0.35866937 0.35903123 0.39794636 0.39622128↙
0.37635228 0.48386648 0.45387810 0.50429422 0.49092054 0.35866398 0.49722296 0.45307758↙
0.44976237 0.40819031 0.39566854];
make_figures
lifespan_SI(:,1) = [];
iNet_SI(1,:) = [];
pre_first_ses = [0.40465483 0.47502443 0.42045888];
post_first_ses = [0.35866937 0.35903123 0.39794636 0.39622128 0.37635228 0.48386648↙
0.45387810 0.50429422 0.49092054 0.35866398 0.49722296 0.45307758 0.44976237 0.40819031↙
0.39566854];
handles = plotSpread([pre_first_ses post_first_ses], 'distributionMarkers', {'o', '*'},↙
'distributionColors', rgb_for_plot', 'xNames', subs)
handles = plotSpread([pre_first_ses post_first_ses], 'distributionMarkers',↙
{'o','o','o','*','*','*','*','*','*','*','*','*','*','*','*','*','*', '*'},↙
'distributionColors', rgb_for_plot', 'xNames', subs)
close all
make_figures
ph
ph.MarkerFaceColor
help plot
ah
ah.MarkerFaceColor
ah.MarkerFaceColor = plotColors{iData,iCategory};
fh.MarkerFaceColor = plotColors{iData,iCategory};
parserObj.MarkerFaceColor = plotColors{iData,iCategory};
close all
p = plot([1 2 3 4 5 6],[0 3 1 6 4 10],'-o','LineWidth',3);
clear all
p = plot([1 2 3 4 5 6],[0 3 1 6 4 10],'-o','LineWidth',3);
clear all
make_figures
'MarkerFaceColor', plotColors{iData,iCategory},...
make_figures
handles = plotSpread([lifespan_SI' iNet_SI], 'distributionMarkers', {'o'},↙
'distributionColors', rgb_for_plot', 'xNames', subs)
close all
make_figures
close all
```

```
make_figures
handles = plotSpread([lifespan_SI' iNet_SI], 'distributionMarkers', {'o'},↙
'distributionColors', rgb_for_plot', 'xNames', subs)
make_figures
handles = plotSpread([lifespan_SI' iNet_SI], 'distributionMarkers', {'o'},↙
'distributionColors', rgb_for_plot', 'xNames', subs, 'binWidth', .5)
make_figures
handles = plotSpread([lifespan_SI' iNet_SI], 'distributionMarkers', {'o'},↙
'distributionColors', rgb_for_plot', 'xNames', subs, 'binWidth', 1)
rgb_colors = [0 0 0;
0 0 0;
0 0 0;
0 0 0;
0 0 0;
0 0 0;
0 0 0;
0 0 0;
1 1 1;
1 1 1;
1 1 1;
1 1 1;
1 1 1;
1 1 1;
1 1 1;
1 1 1;
1 1 1;
1 1 1];
for n = 1:numel(subs)
rgb_for_plot{n} = rgb_colors(n,:);
end
handles = plotSpread([lifespan_SI' iNet_SI], 'distributionMarkers', {'o'},↙
'distributionColors', rgb_for_plot', 'xNames', subs, 'binWidth', 1)
pre_first_ses = [0.40465483 0.47502443 0.42045888];
post_first_ses = [0.35866937 0.35903123 0.39794636 0.39622128 0.37635228 0.48386648↙
0.45387810 0.50429422 0.49092054 0.35866398 0.49722296 0.45307758 0.44976237 0.40819031↙
0.39566854];
handles = plotSpread([pre_first_ses post_first_ses], 'distributionMarkers', {'^'},↙
'distributionColors', rgb_for_plot', 'xNames', subs)
rgb_colors = [1 0 0;%LS02
0, 1, 0;%LS03
0, 0, 1;%LS05
0, 1, 1;%LS08
1, 0, 1;%LS11
0.4660 0.6740 0.188;%LS14
0.9290 0.6940 0.1250;%LS16
0.4940 0.1840 0.5560;%LS17
0 0 0;
0 0 0;
0 0 0;
0 0 0;
0 0 0;
0 0 0;
0 0 0;
0 0 0;
0 0 0;
0 0 0];
subs = {'LS02', 'LS03', 'LS05', 'LS08', 'LS11', 'LS14',↙
'LS16','LS17','INET001','INET002',↙
'INET003','INET005','INET006','INET010','INET016','INET018','INET019','INET030'};
for n = 1:numel(subs)
```

```
rgb_for_plot{n} = rgb_colors(n,:);
end
handles = plotSpread([pre_first_ses post_first_ses], 'distributionMarkers', {'^'},↙
'distributionColors', rgb_for_plot', 'xNames', subs)
pre_first_ses = [-1 -1 -1];
handles = plotSpread([pre_first_ses post_first_ses], 'distributionMarkers', {'^'},↙
'distributionColors', rgb_for_plot', 'xNames', subs)
handles = plotSpread([pre_first_ses post_first_ses], 'distributionMarkers', {'d'},↙
'distributionColors', rgb_for_plot', 'xNames', subs)
close all
make_figures
handles = plotSpread([lifespan_SI' iNet_SI], 'distributionMarkers', {'o'},↙
'distributionColors', rgb_for_plot', 'xNames', subs, 'binWidth', 1)
close all
make_figures
handles = plotSpread([lifespan_SI' iNet_SI], 'distributionMarkers', {'o'},↙
'distributionColors', rgb_for_plot', 'xNames', subs, 'binWidth', 1)
make_figures
handles = plotSpread([lifespan_SI' iNet_SI], 'distributionMarkers', {'o'},↙
'distributionColors', rgb_for_plot', 'xNames', subs, 'binWidth', 1)
rgb_colors = [0 0 0;
0 0 0;
1 1 1;
0 0 0;
0 0 0;
0 0 0;
0 0 0;
0 0 0;
1 1 1;
1 1 1;
1 1 1;
1 1 1;
1 1 1;
1 1 1;
1 1 1;
1 1 1;
1 1 1;
1 1 1];
for n = 1:numel(subs)
rgb_for_plot{n} = rgb_colors(n,:);
end
handles = plotSpread([lifespan_SI' iNet_SI], 'distributionMarkers', {'o'},↙
'distributionColors', rgb_for_plot', 'xNames', subs, 'binWidth', 1)
within_sub_reliability
addpath '/Users/dianaperez/Documents/GitHub/GrattonLab-General-Repo/FCProcess'
within_sub_reliability
mean(allsubs_seg_ind{1,1},2);
mean(allsubs_seg_ind{1,1},1);
plot(times_all(s,1:size(allsubs_seg_ind{s},2)),mean(allsubs_seg_ind{1,s},1)),'Color',↙
rgb_colors(s,:),'LineWidth', 3)
hold on
plot(times_all(s,1:size(allsubs_seg_ind{s},2)),mean(allsubs_seg_ind{1,s},1),'Color',↙
rgb_colors(s,:),'LineWidth', 3)
within_sub_reliability
clear all
within_sub_reliability
mean_seg_inds{s} = mean(sub_seg_index,1);
mean_abs_diff{s} = mean(abs_diffs,1);
within_sub_reliability
times =[2.5:2.5:100];
```

```
figure;
for s = 1:numel(subject)
plot(times_all(s,1:size(mean_seg_inds{s},2)),mean_abs_diffs(s,1:size(allsubs_seg_ind{s},↙
2)),'Color',rgb_colors(s,:),'LineWidth', 3)
hold on
end
for s = 1:numel(subject)
plot(times_all(s,1:size(mean_seg_inds{s},2)),mean_abs_diff(s,1:size(allsubs_seg_ind{s},↙
2)),'Color',rgb_colors(s,:),'LineWidth', 3)
hold on
end
mean_abs_diff(s,1:size(allsubs_seg_ind{s},2))
allsubs_seg_ind{s}
size(mean_abs_diff{s},2)
mean_abs_diff(s,1:size(mean_abs_diff{s},2))
mean_abs_diff{1,s}
for s = 1:numel(subject)
plot(times_all(s,1:size(mean_seg_inds{s},2)),mean_abs_diff{1,s},'Color',rgb_colors↙
(s,:),'LineWidth', 3)
hold on
end
size(mean_seg_inds{s},2)
times_all(s,1:size(mean_seg_inds{s},2))
mean_abs_diff{1,s}
within_sub_reliability
mean_seg_inds{s} = mean(sub_seg_index,1);
within_sub_reliability
mean(allsubs_abs_diffs{1,s},2)
mean(allsubs_abs_diffs{1,s},1)
times =[2.5:2.5:100];
figure;
for s = 1:numel(subject)
plot(times_all(s,1:size(allsubs_seg_inds{s},2)),mean(allsubs_abs_diffs{1,s},1),'Color',↙
rgb_colors(s,:),'LineWidth', 3)
hold on
end
times =[2.5:2.5:100];
figure;
for s = 1:numel(subject)
plot(times_all(s,1:size(allsubs_seg_ind{s},2)),mean(allsubs_abs_diffs{1,s},1),'Color',↙
rgb_colors(s,:),'LineWidth', 3)
hold on
end
mean(allsubs_abs_diffs{1,s}(:,1:size(allsubs_seg_ind{s},2)
mean(allsubs_abs_diffs{1,s}(:,1:size(allsubs_seg_ind{s},2)))
times =[2.5:2.5:100];
figure;
for s = 1:numel(subject)
plot(times_all(s,1:size(allsubs_seg_ind{s},2)),mean(allsubs_abs_diffs{1,s}(:,1:size↙
(allsubs_seg_ind{s},2))),1),'Color',rgb_colors(s,:),'LineWidth', 3)
hold on
end
times =[2.5:2.5:100];
figure;
for s = 1:numel(subject)
plot(times_all(s,1:size(allsubs_seg_ind{s},2)),mean(allsubs_abs_diffs{1,s}(:,1:size↙
(allsubs_seg_ind{s})),1),'Color',rgb_colors(s,:),'LineWidth', 3)
hold on
end
times_all(s,1:size(allsubs_seg_ind{s},2))
```

```
mean(allsubs_abs_diffs{1,s}(:,1:size(allsubs_seg_ind{s})),1)
mean(allsubs_abs_diffs{1,s}(:,1:size(allsubs_seg_ind{s})),2)
mean(allsubs_abs_diffs{1,s}(:,1:size(allsubs_seg_ind{s})),1)
allsubs_abs_diffs{1,s}(:,1:size(allsubs_seg_ind{s},2))
mean(allsubs_abs_diffs{1,s}(:,1:size(allsubs_seg_ind{s},2)),1)
times =[2.5:2.5:100];
figure;
for s = 1:numel(subject)
plot(times_all(s,1:size(allsubs_seg_ind{s},2)),mean(allsubs_abs_diffs{1,s}(:,1:size↙
(allsubs_seg_ind{s},2)),1),'Color',rgb_colors(s,:),'LineWidth', 3)
hold on
end
figure;
for s = 1:numel(subject)
plot(times_all(s,1:size(allsubs_seg_ind{s},2)),mean(allsubs_seg_ind{1,s}(:,1:size↙
(allsubs_seg_ind{s},2)),1),'Color',rgb_colors(s,:),'LineWidth', 3)
hold on
end
within_sub_reliability
ylabel('% Difference');
xlabel('Time (Minutes)');
axis([0 100 0 .3])
ylabel('% Difference');
xlabel('Time (Minutes)');
m = findobj(gca,'Type','line');
hleg1 = legend(m(1:8), 'LS17', 'LS16', 'LS14', 'LS11', 'LS08', 'LS05', 'LS03', 'LS02',↙
'Location', 'NorthEast');
hleg1.FontSize = 20;
ax = gca;
ax.FontSize = 24;
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.5, 0.7, 0.5, 0.7]);
%
times =[2.5:2.5:100];
figure;
for s = 1:numel(subject)
plot(times_all(s,1:size(allsubs_seg_ind{s},2)),mean(allsubs_abs_diffs{1,s}(:,1:size↙
(allsubs_seg_ind{s},2)),1),'Color',rgb_colors(s,:),'LineWidth', 3)
hold on
end
ylabel('% Difference');
xlabel('Time (Minutes)');
m = findobj(gca,'Type','line');
hleg1 = legend(m(1:8), 'LS17', 'LS16', 'LS14', 'LS11', 'LS08', 'LS05', 'LS03', 'LS02',↙
'Location', 'NorthEast');
hleg1.FontSize = 20;
hleg1.FontSize = 24;
hleg1.FontSize = 20;
ax = gca;
ax.FontSize = 24;
ax.FontSize = 15;
ax.FontSize = 10;
xticks([0:10:100])
print(gcf,['/Volumes/RESEARCH_HD/Lifespan/CNS_Analyses/ReliabilityLifespanSegIndex_Diff.↙
jpg'],'-dpng','-r300');
figure;
for s = 1:numel(subject)
plot(times_all(s,1:size(allsubs_seg_ind{s},2)),mean(allsubs_seg_ind{1,s}(:,1:size↙
(allsubs_seg_ind{s},2)),1),'Color',rgb_colors(s,:),'LineWidth', 3)
hold on
end
```

```
ylabel('Expectation Value');
xlabel('Time (Minutes)');
m = findobj(gca,'Type','line');
ax = gca;
ax.FontSize = 24;
xticks([0:10:100])
axis([0 100 .3 .55])
print(gcf,['/Volumes/RESEARCH_HD/Lifespan/CNS_Analyses/ReliabilityLifespanSegIndex.↙
jpg'],'-dpng','-r300');
similarity_analysis_wLongitudinal
hline_new([0,8,18]+0.5,'k',2);
hline_new([0,3,13,23]+0.5,'k',.5);
vline_new([0,8,18]+0.5,'k',2);
vline_new([0,3,13,23]+0.5,'k',.5);
hline_new([0,8,18,28]+0.5,'k',2);
hline_new([0,3,13,23]+0.5,'k',.5);
vline_new([0,8,18,28]+0.5,'k',2);
vline_new([0,3,13,23]+0.5,'k',.5);
set(gca,'XTick',[4,13.5,23.5], 'YTick', [4,13.5,23.5], 'XTickLabel',...
{'LS02', 'LS03', 'LS05'}, 'YTickLabel', {'LS02', 'LS03', 'LS05'});
axis square;
colorbar;
ax = gca;
ax.FontSize = 24;
xticklabel([])
xticklabels([])
yticklabels([])
ses_pre = [3,5,5];
ses_post = [5,5,5];
count = 1;
within = [];
between = [];
s =1;
ses_pre = [3,5,5];
ses_post = [5,5,5];
count = 1;
within = [];
between = [];
lines = [count:(ses_pre(s)+ses_post(s))-1];
lines = [count:(ses_pre(s)+ses_post(s))];
sub_vals = simmat(lines,:);
maskmat = ones(sessions,sessions);
maskmat = logical(triu(maskmat, 1));
sub_vals = simmat(lines,:);
maskmat = ones(length(lines),length(lines));
sub_vals = simmat(lines,:);
within_sub = sub_vals(:,lines);
within = [within; within_sub(maskmat)];
maskmat = ones(size(sub_vals));
maskmat(:,lines) = 0;
between = [between; sub_vals(maskmat==1)];
count = lines(end)+1;
s = 2;
lines = [count:(ses_pre(s)+ses_post(s))];
(ses_pre(s)+ses_post(s))
lines = [count:count+(ses_pre(s)+ses_post(s))];
lines = [count:count+(ses_pre(s)+ses_post(s))-1];
sub_vals = simmat(lines,:);
maskmat = ones(sessions,sessions);
maskmat = logical(triu(maskmat, 1));
```

```
within_sub = sub_vals(:,lines);
within = [within; within_sub(maskmat)];
maskmat = ones(size(sub_vals));
maskmat(:,lines) = 0;
between = [between; sub_vals(maskmat==1)];
count = lines(end)+1;
sub_vals = simmat(lines,:);
maskmat = ones(length(lines),length(lines));
maskmat = logical(triu(maskmat, 1));
within_sub = sub_vals(:,lines);
within = [within; within_sub(maskmat)];
maskmat = ones(size(sub_vals));
maskmat(:,lines) = 0;
between = [between; sub_vals(maskmat==1)];
count = lines(end)+1;
s = 1;
count = 1;
within = [];
between = [];
lines = [count:count+(ses_pre(s)+ses_post(s))-1];
sub_vals = simmat(lines,:);
maskmat = ones(length(lines),length(lines));
maskmat = logical(triu(maskmat, 1));
within_sub = sub_vals(:,lines);
within_sub(maskmat)
within = [within; within_sub(maskmat)];
maskmat = ones(size(sub_vals));
maskmat(:,lines) = 0;
between = [between; sub_vals(maskmat==1)];
count = lines(end)+1;
s = 2;
lines = [count:count+(ses_pre(s)+ses_post(s))-1];
sub_vals = simmat(lines,:);
maskmat = ones(length(lines),length(lines));
maskmat = logical(triu(maskmat, 1));
within_sub = sub_vals(:,lines);
within = [within; within_sub(maskmat)];
maskmat = ones(size(sub_vals));
maskmat(:,lines) = 0;
between = [between; sub_vals(maskmat==1)];
count = lines(end)+1;
s = 3;
lines = [count:count+(ses_pre(s)+ses_post(s))-1];
sub_vals = simmat(lines,:);
maskmat = ones(length(lines),length(lines));
maskmat = logical(triu(maskmat, 1));
within_sub = sub_vals(:,lines);
within = [within; within_sub(maskmat)];
maskmat = ones(size(sub_vals));
maskmat(:,lines) = 0;
between = [between; sub_vals(maskmat==1)];
count = lines(end)+1;
mean(between)
mean(within)
reliability_analysis
clear all
reliability_analysis
%-- 4/14/22, 5:29 PM --%
3818/136
3818/270
```

```
reliability_analysis_v2
70/2.5
reliability_analysis_v2
count+sampStep
reliability_analysis_v2
indices_for_data(set,:) = count:sampStep;
count:sampStep;
count
count+sampStep
reliability_analysis_v2
start_at_pt = datasample(num_sets,1);
count = start_at_pt
num_sets
datasample(num_sets,1)
rng('shuffle')
datasample(num_sets,1)
datasample(1:num_sets,1)
count = datasample(1:num_sets,1);
true_half_inds = [];
while length(true_hald_inds) < pts2sample
if count <= num_sets
true_half_inds = [true_half_inds; indices_for_sets(count,:)'];
count = count + 1;
end
end
while length(true_half_inds) < pts2sample
if count <= num_sets
true_half_inds = [true_half_inds; indices_for_sets(count,:)'];
count = count + 1;
end
end
while length(true_half_inds) < pts2sample
if count <= num_sets
true_half_inds = [true_half_inds; indices_for_data(count,:)'];
count = count + 1;
end
end
3944*1.1
/60
(3944*1.1)/60
3818/136
136*28
(3808*1.1)/60
reliability_analysis_v2
indices_for_data(end-num_true_half_sets:end);
indices_for_data(end-num_true_half_sets-1:end);
indices_for_data(end-(num_true_half_sets-1):end);
indices_for_rest_of_data = indices_for_data;
indices_for_rest_of_data(end-(num_true_half_sets-1):end) = [];
indices_for_rest_of_data = indices_for_data;
indices_for_rest_of_data((end-(num_true_half_sets-1)):end,:) = [];
reliability_analysis_v2
size(indices_for_rest_of_data,1)
times = [2.5:2.5:((size(indices_for_rest_of_data,1))*2.5)];
datasample(1:size(indices_for_rest_of_data,1),1);
reliability_analysis_v2
corr_means = mean(allsubs_corrs);
reliability_analysis_v2
mean = [0.467687886 0.559761435 0.632339679 0.66006551  0.690802314 0.718423844↙
0.734759345 0.732076428 0.752826409 0.764049345 0.772971331 0.781086781 0.792362846↙
```

```
0.790422743 0.798111731 0.809298493 0.802306023 0.81222891  0.81431187  0.816426924↙
0.822798413 0.828645946 0.830524224 0.83257417  0.83115552  0.837167681 0.840971793↙
0.842499929 0.839556975 0.841703753 0.84395807  0.846296928 0.850515097 0.850531645↙
0.8533126   0.850525042 0.853731175 0.85390665  0.854444922 0.85268042  0.857144836↙
0.858457492 0.858360196 0.859544358 0.861655104 0.861233008 0.862832248 0.863479792↙
0.862828184 0.857708573 0.87665832  0.877845915 0.87690863  0.878025055];
s = 3;
means{1,s}
figure;
for s = 1:numel(subject)
plot(times_all(s,1:size(allsubs_seg_ind{s},2)),means{1,s},'Color',rgb_colors↙
(s,:),'LineWidth', 3)
hold on
end
for s = 1:numel(subject)
plot(times_all(s,1:size(means{1,s},2)),means{1,s},'Color',rgb_colors(s,:),'LineWidth', 3)
hold on
end
plot(times(1:20),mean(1:20), ':', 'Color', [0,0,0], 'LineWidth',3) %average
plot(times_all(1,1:20),mean(1:20), ':', 'Color', [0,0,0], 'LineWidth',3) %average
plot(times_all(1,1:40),mean(1:40), ':', 'Color', [0,0,0], 'LineWidth',3) %average
plot(times_all(1,1:4),mean(1:48), ':', 'Color', [0,0,0], 'LineWidth',3) %average
plot(times_all(1,1:48),mean(1:48), ':', 'Color', [0,0,0], 'LineWidth',3) %average
reliability_analysis_v2
mean = [0.466963624 0.568742573 0.62424519  0.662057459 0.689187726 0.709678761↙
0.726053023 0.74064818  0.751189469 0.762092324 0.771169663 0.778562048 0.785648176↙
0.791579589 0.797392614 0.802157453 0.806759886 0.810889354 0.814636111 0.818249976↙
0.821505513 0.824875033 0.828085976 0.83154268  0.83431512  0.836681223 0.838774137↙
0.841217936 0.840038058 0.841879417 0.84428506  0.846331487 0.847734422 0.849486222↙
0.851167548 0.852191338 0.853726477 0.854901912 0.85528071  0.856386732 0.857766222↙
0.858754624 0.859717988 0.86083224  0.861552202 0.862601614 0.863284792 0.86391976↙
0.864501404 0.8579562   0.8746753   0.875439495 0.87587905  0.87634486];
plot(times_all(1,1:4),mean(1:48), ':', 'Color', [0,0,0], 'LineWidth',3) %average
plot(times_all(1,1:48),mean(1:48), ':', 'Color', [0,0,0], 'LineWidth',3) %average
ylabel('Pearson Correlation (r)');
xlabel('Time (Minutes)');
m = findobj(gca,'Type','line');
hleg1 = legend(m(1:9), 'Mean', 'LS17', 'LS16', 'LS14', 'LS11', 'LS08', 'LS05', 'LS03',↙
'LS02', 'Location', 'SouthEast');
hleg1.FontSize = 20;
ax = gca;
ax.FontSize = 24;
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.5, 0.7, 0.5, 0.7]);
ylabel('Pearson Correlation (r)');
xlabel('Time (Minutes)');
m = findobj(gca,'Type','line');
hleg1 = legend(m(1:9), 'Mean', 'LS17', 'LS16', 'LS14', 'LS11', 'LS08', 'LS05', 'LS03',↙
'LS02', 'Location', 'SouthEast');
hleg1.FontSize = 20;
ax = gca;
ax.FontSize = 24;
clear set
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.5, 0.7, 0.5, 0.7]);
xticks([5:5:120])
axis([5 120 .3 1])
xticks([10:10:120])
print(gcf,↙
['/Volumes/RESEARCH_HD/Lifespan/CNS_Analyses/ReliabilityLifespanRestDatatruhalf' num2str↙
(pts2sample) '.jpg'],'-dpng','-r300');
print(gcf,↙
```

```
['/Users/dianaperez/Desktop/Lifespan/CNS_Analyses/ReliabilityLifespanRestDatatruhalf'↙
num2str(pts2sample) '.jpg'],'-dpng','-r300');
print(gcf,['/Users/dianaperez/Desktop/Lifespan/ReliabilityLifespanRestDatatruhalf'↙
num2str(pts2sample) '.jpg'],'-dpng','-r300');
print(gcf,['/Users/dianaperez/Desktop/Lifespan/ReliabilityLifespanRestData.jpg'],'-↙
dpng','-r300');
within_sub_reliability_v2
addpath '/Users/dianaperez/Documents/GitHub/GrattonLab-General-Repo/FCProcess'
within_sub_reliability_v2
figure;
for s = 1:numel(subject)
plot(times_all(s,1:size(allsubs_seg_ind{s},2)),mean(allsubs_seg_ind{1,s}(:,1:size↙
(allsubs_seg_ind{s},2)),1),'Color',rgb_colors(s,:),'LineWidth', 3)
hold on
end
ylabel('Expectation Value');
xlabel('Time (Minutes)');
m = findobj(gca,'Type','line');
ax = gca;
ax.FontSize = 24;
print(gcf,['/Volumes/RESEARCH_HD/Lifespan/CNS_Analyses/ReliabilityLifespanSegIndex.↙
jpg'],'-dpng','-r300');
%-- 4/15/22, 2:51 PM --%
within_sub_reliability_v2
addpath '/Users/dianaperez/Documents/GitHub/GrattonLab-General-Repo/FCProcess'
within_sub_reliability_v2
s = 1
mean(allsubs_seg_ind{1,s}(:,1:size(allsubs_seg_ind{s},2)),1)
s = 2
[0.17513525,0.23543307,0.26925221,0.29455280,0.31462324,0.32750398,0.33855036,0.34856731,↙
0.35695845,0.36352569,0.36956799,0.37590152,0.38027725,0.38332370,0.38977948,0.39222571,0↙
.39717701,0.39897895,0.40176255,0.40565437,0.40783823,0.40995008,0.41150612,0.41320971,0.↙
41662928,0.41748437,0.41961083,0.42092493,0.42268413,0.42396396,0.42558959,0.42672858,0.4↙
2872712,0.42987919,0.43015543,0.43192738,0.43253067,0.43378815,0.43526950,0.43594587,0.43↙
680459,0.43797994,0.43884566,0.43988848,0.44037372,0.44093323,0.44164586,0.44217351,0.442↙
47830]
mean(allsubs_seg_ind{1,s}(:,1:size(allsubs_seg_ind{s},2)),1)
s = 3
mean(allsubs_seg_ind{1,s}(:,1:size(allsubs_seg_ind{s},2)),1)
s = 4
mean(allsubs_seg_ind{1,s}(:,1:size(allsubs_seg_ind{s},2)),1)
s = 5
mean(allsubs_seg_ind{1,s}(:,1:size(allsubs_seg_ind{s},2)),1)
s = 6
mean(allsubs_seg_ind{1,s}(:,1:size(allsubs_seg_ind{s},2)),1)
s = 7
mean(allsubs_seg_ind{1,s}(:,1:size(allsubs_seg_ind{s},2)),1)
s = 8
mean(allsubs_seg_ind{1,s}(:,1:size(allsubs_seg_ind{s},2)),1)
means = [0.228121374    0.282854956 0.311825923 0.330394855 0.344075468 0.3540615↙
0.362085299 0.368580906 0.374353669 0.378886496 0.38303392  0.386997298 0.39018919↙
0.392779018 0.395671349 0.3921087   0.394652817 0.396349383 0.398223    0.39998822↙
0.401678269 0.402921549 0.404130596 0.405287927 0.406779144 0.407857626 0.408819803↙
0.40779906  0.4087539   0.409494202 0.41042813  0.411371703 0.4121878   0.412706817↙
0.413360333 0.414032785 0.41465492  0.419794232 0.420634614 0.420983464 0.421506702↙
0.421954376 0.422355276 0.42278862  0.423175282 0.42350195  0.423740618 0.42402081↙
0.434813233 0.42669529  0.42691267  0.42712188  0.42740375];
plot(times_all(1,1:48),means(1:48), ':', 'Color', [0,0,0], 'LineWidth',3)
ylabel('Segregation Index');
xlabel('Time (Minutes)');
```

```
m = findobj(gca,'Type','line');
hleg1 = legend(m(1:9), 'Mean', 'LS17', 'LS16', 'LS14', 'LS11', 'LS08', 'LS05', 'LS03',↙
'LS02', 'Location', 'NorthEast');
hleg1.FontSize = 20;
ax = gca;
ax.FontSize = 24;
m = findobj(gca,'Type','line');
hleg1 = legend(m(1:9), 'Mean', 'LS17', 'LS16', 'LS14', 'LS11', 'LS08', 'LS05', 'LS03',↙
'LS02', 'Location', 'SouthEast');
hleg1.FontSize = 20;
ax = gca;
ax.FontSize = 24;
axis([0 120 .1 .5])
times =[2.5:2.5:100];
figure;
for s = 1:numel(subject)
plot(times_all(s,1:size(allsubs_seg_ind{s},2)),mean(allsubs_abs_diffs{1,s}(:,1:size↙
(allsubs_seg_ind{s},2)),1),'Color',rgb_colors(s,:),'LineWidth', 3)
hold on
end
figure;
for s = 1:numel(subject)
plot(times_all(s,1:size(allsubs_seg_ind{s},2)),mean(allsubs_abs_diffs{1,s}(:,1:size↙
(allsubs_seg_ind{s},2)),1),'Color',rgb_colors(s,:),'LineWidth', 3)
hold on
means_diff(s,:) = mean(allsubs_abs_diffs{1,s}(:,1:size(allsubs_seg_ind{s},2)),1);
end
figure;
for s = 1:numel(subject)
plot(times_all(s,1:size(allsubs_seg_ind{s},2)),mean(allsubs_abs_diffs{1,s}(:,1:size↙
(allsubs_seg_ind{s},2)),1),'Color',rgb_colors(s,:),'LineWidth', 3)
hold on
means_diff{s} = mean(allsubs_abs_diffs{1,s}(:,1:size(allsubs_seg_ind{s},2)),1);
end
means_diff = [];
figure;
for s = 1:numel(subject)
plot(times_all(s,1:size(allsubs_seg_ind{s},2)),mean(allsubs_abs_diffs{1,s}(:,1:size↙
(allsubs_seg_ind{s},2)),1),'Color',rgb_colors(s,:),'LineWidth', 3)
hold on
means_diff{s} = mean(allsubs_abs_diffs{1,s}(:,1:size(allsubs_seg_ind{s},2)),1);
end
mean_diff_all = [0.451054915    0.31958749  0.250078328 0.205589374 0.173270193↙
0.149834654 0.130898036 0.116096011 0.103579279 0.09357542  0.085252215 0.077510628↙
0.071893195 0.067765274 0.063014982 0.0609474   0.057319998 0.055589204 0.053587631↙
0.051688755 0.049855826 0.049189074 0.047716066 0.047485058 0.046371319 0.046092851↙
0.045026644 0.049051036 0.048147125 0.04798667  0.047803287 0.048079218 0.047927852↙
0.047976362 0.048676489 0.048785449 0.048605224 0.048932758 0.049221036];
plot(times_all(1,1:48),mean_diff_all(1:48), ':', 'Color', [0,0,0], 'LineWidth',3)
mean_diff_all = [0.451054915    0.31958749  0.250078328 0.205589374 0.173270193↙
0.149834654 0.130898036 0.116096011 0.103579279 0.09357542  0.085252215 0.077510628↙
0.071893195 0.067765274 0.063014982 0.0609474   0.057319998 0.055589204 0.053587631↙
0.051688755 0.049855826 0.049189074 0.047716066 0.047485058 0.046371319 0.046092851↙
0.045026644 0.049051036 0.048147125 0.04798667  0.047803287 0.048079218 0.047927852↙
0.047976362 0.048676489 0.048785449 0.048605224 0.048932758 0.049221036 0.049052662↙
0.049501161 0.049540971 0.049734258 0.04993298  0.050447245 0.050401381 0.0504621↙
0.050506165 0.048969311 0.042753616 0.042789566 0.043138017 0.043480223 0.026972895];
plot(times_all(1,1:48),mean_diff_all(1:48), ':', 'Color', [0,0,0], 'LineWidth',3)
axis([0 120 0 .6])
ylabel('% Difference');
```

```
xlabel('Time (Minutes)');
m = findobj(gca,'Type','line');
hleg1 = legend(m(1:9), 'Mean', 'LS17', 'LS16', 'LS14', 'LS11', 'LS08', 'LS05', 'LS03',↙
'LS02', 'Location', 'NorthEast');
hleg1.FontSize = 20;
ax = gca;
ax.FontSize = 24;
print(gcf,[output_dir '/ReliabilityLifespanSegIndex_Diff.jpg'],'-dpng','-r300');
figure;
for s = 1:numel(subject)
plot(times_all(s,1:size(allsubs_seg_ind{s},2)),mean(allsubs_seg_ind{1,s}(:,1:size↙
(allsubs_seg_ind{s},2)),1),'Color',rgb_colors(s,:),'LineWidth', 3)
hold on
end
means = [0.228121374    0.282854956 0.311825923 0.330394855 0.344075468 0.3540615↙
0.362085299 0.368580906 0.374353669 0.378886496 0.38303392  0.386997298 0.39018919↙
0.392779018 0.395671349 0.3921087   0.394652817 0.396349383 0.398223    0.39998822↙
0.401678269 0.402921549 0.404130596 0.405287927 0.406779144 0.407857626 0.408819803↙
0.40779906  0.4087539   0.409494202 0.41042813  0.411371703 0.4121878   0.412706817↙
0.413360333 0.414032785 0.41465492  0.419794232 0.420634614 0.420983464 0.421506702↙
0.421954376 0.422355276 0.42278862  0.423175282 0.42350195  0.423740618 0.42402081↙
0.434813233 0.42669529  0.42691267  0.42712188  0.42740375];
plot(times_all(1,1:48),means(1:48), ':', 'Color', [0,0,0], 'LineWidth',3)
ylabel('Segregation Index');
xlabel('Time (Minutes)');
%m = findobj(gca,'Type','line');
%hleg1 = legend(m(1:9), 'Mean', 'LS17', 'LS16', 'LS14', 'LS11', 'LS08', 'LS05', 'LS03',↙
'LS02', 'Location', 'SouthEast');
%hleg1.FontSize = 20;
ax = gca;
ax.FontSize = 24;
axis([0 120 0 .6])
axis([0 120 0.1 .5])
axis([0 120 0.15 .5])
xticks(0:10:120)
ax = gca;
ax.FontSize = 20;
print(gcf,[output_dir '/ReliabilityLifespanSegIndex.jpg'],'-dpng','-r300');
figure;
for s = 1:numel(subject)
plot(times_all(s,1:size(allsubs_seg_ind{s},2)),mean(allsubs_abs_diffs{1,s}(:,1:size↙
(allsubs_seg_ind{s},2)),1),'Color',rgb_colors(s,:),'LineWidth', 3)
hold on
means_diff{s} = mean(allsubs_abs_diffs{1,s}(:,1:size(allsubs_seg_ind{s},2)),1);
end
mean_diff_all = [0.451054915    0.31958749  0.250078328 0.205589374 0.173270193↙
0.149834654 0.130898036 0.116096011 0.103579279 0.09357542  0.085252215 0.077510628↙
0.071893195 0.067765274 0.063014982 0.0609474   0.057319998 0.055589204 0.053587631↙
0.051688755 0.049855826 0.049189074 0.047716066 0.047485058 0.046371319 0.046092851↙
0.045026644 0.049051036 0.048147125 0.04798667  0.047803287 0.048079218 0.047927852↙
0.047976362 0.048676489 0.048785449 0.048605224 0.048932758 0.049221036 0.049052662↙
0.049501161 0.049540971 0.049734258 0.04993298  0.050447245 0.050401381 0.0504621↙
0.050506165 0.048969311 0.042753616 0.042789566 0.043138017 0.043480223 0.026972895];
plot(times_all(1,1:48),mean_diff_all(1:48), ':', 'Color', [0,0,0], 'LineWidth',3)
axis([0 120 0 .6])
ylabel('% Difference');
xlabel('Time (Minutes)');
m = findobj(gca,'Type','line');
hleg1 = legend(m(1:9), 'Mean', 'LS17', 'LS16', 'LS14', 'LS11', 'LS08', 'LS05', 'LS03',↙
'LS02', 'Location', 'NorthEast');
```

```
hleg1.FontSize = 20;
ax = gca;
ax.FontSize = 20;
xticks(0:10:120)
print(gcf,[output_dir '/ReliabilityLifespanSegIndex_Diff.jpg'],'-dpng','-r300');
similarity_analysis_wLongitudinal
%-- 4/19/22, 3:47 PM --%
within_sub_reliability_v2
addpath '/Users/dianaperez/Documents/GitHub/GrattonLab-General-Repo/FCProcess'
within_sub_reliability_v2
addpath '/Users/dianaperez/Documents/GitHub/Lifespan-Analysis'
within_sub_reliability_v2
rgb_colors = [1 0 0;%LS02 red
0, 1, 0;%LS03 green
0, 0, 1;%LS05 blue
0, 1, 1;%LS08 cyan
1, 0, 1;%LS11 magenta
0.4660 0.6740 0.188;%LS14 other green
0.9290 0.6940 0.1250;%LS16  yellow orange-y
0.4940 0.1840 0.5560;%LS17 purple
0.4660 0.6740 0.1880;
0.4660 0.6740 0.1880];
rgb_colors = [1 0 0;%LS02 red
0, 1, 0;%LS03 green
0, 0, 1;%LS05 blue
0, 1, 1;%LS08 cyan
1, 0, 1;%LS11 magenta
0.4660 0.6740 0.188;%LS14 other green
0.9290 0.6940 0.1250;%LS16  yellow orange-y
0.4940 0.1840 0.5560; 0.3010 0.7450 0.9330; 0.8500 0.3250 0.0980];%LS17 purple
axis([0 120 0 .6])
ylabel('% Difference');
xlabel('Time (Minutes)');
m = findobj(gca,'Type','line');
hleg1 = legend(m(1:9), 'Mean', 'LS17', 'LS16', 'LS14', 'LS11', 'LS08', 'LS05', 'LS03',↙
'LS02', 'Location', 'NorthEast');
hleg1.FontSize = 20;
ax = gca;
ax.FontSize = 24;
%
print(gcf,[output_dir '/ReliabilityiNETSegIndex_Diff.jpg'],'-dpng','-r300');
axis([0 80 0 .6])
axis([0 80 0 .5])
axis([0 70 0 .5])
hleg1 = legend(m(1:9), 'Mean', 'LS17', 'LS16', 'LS14', 'LS11', 'LS08', 'LS05', 'LS03',↙
'LS02', 'Location', 'NorthEast');
hleg1 = legend(m(1:10), subject, 'Location', 'NorthEast');
print(gcf,[output_dir '/ReliabilityLifespanSegIndex_Diff.jpg'],'-dpng','-r300');
figure;
for s = 1:numel(subject)
plot(times_all(s,1:size(allsubs_seg_ind{s},2)),mean(allsubs_seg_ind{1,s}(:,1:size↙
(allsubs_seg_ind{s},2)),1),'Color',rgb_colors(s,:),'LineWidth', 3)
hold on
end
endax = gca;
ax.FontSize = 20;
ax = gca;
ax.FontSize = 20;
ylabel('Segregation Index');
xlabel('Time (Minutes)');
```

```
print(gcf,[output_dir '/ReliabilityiNETSegIndex.jpg'],'-dpng','-r300')
load('/Users/dianaperez/Desktop/Segregation_Analyses/INET_allsubs_seg_index_ses.mat')
clear all
load('/Users/dianaperez/Desktop/Segregation_Analyses/INET_allsubs_seg_index_ses.mat')
load('/Users/dianaperez/Desktop/lifespan_allsubs_seg_index_sub_by_net.mat')
run('/Users/dianaperez/Desktop/segregation_ind_by_sub_by_net.m')
%-- 4/29/22, 3:41 PM --%
hist(logx)
hist(log)
hist(log(x))
rng('default)
rng('default')
x = random(pd,10000,1);
pd = makedist('Lognormal','mu',5,'sigma',2)
x = random(pd,10000,1);
logx = log(x);
hist(logx)
histfit(logx)
cmap = colormap(jet);
H = histfit(logx);
H2 = histcounts(logx);
b = bar(H2, 'facecolor', 'flat');
b.CData = cmap;
H2 = histcounts(logx,256);
b = bar(H2, 'facecolor', 'flat');
b.CData = cmap;
rng('default')
pd = makedist('Lognormal','mu',5,'sigma',2)
x = random(pd,10000,1);
logx = log(x);
cmap = colormap(jet);
nbins = 256;
data = histcounts(logx, nbins);
b = bar(data, 'facecolor', 'flat');
b.CData = cmap;
%-- 5/8/22, 1:31 PM --%
reliability_analysis_v2
mean = [0.515268013 0.622747069 0.681274594 0.718237485 0.745798623 0.765701861↙
0.781850887 0.794715224 0.80590723  0.814858538 0.822555385 0.829795586 0.835691422↙
0.840888584 0.84614858  0.850029338 0.854318895 0.857281215 0.85914574  0.861973127↙
0.864639569 0.867157803 0.869307432 0.871292319 0.872455141 0.864466596 0.85001729↙
0.91664582  0.91766846];
figure;
for s = 1:numel(subject)
plot(times_all(s,1:size(means{1,s},2)),means{1,s},'LineWidth', 3)
hold on
end
ylabel('Pearson Correlation (r)');
xlabel('Time (Minutes)');
plot(times_all(1,1:48),mean(1:48), ':', 'Color', [0,0,0], 'LineWidth',3) %average
plot(times_all(1,1:29),mean(1:29), ':', 'Color', [0,0,0], 'LineWidth',3) %average
clear gcf
figure;
for s = 1:numel(subject)
plot(times_all(s,1:size(means{1,s},2)),means{1,s},'Color',rgb_colors(s,:),'LineWidth', 3)
hold on
end
plot(times_all(1,1:48),mean(1:48), ':', 'Color', [0,0,0], 'LineWidth',3) %average
ylabel('Pearson Correlation (r)');
xlabel('Time (Minutes)');
```

```
figure;
for s = 1:numel(subject)
plot(times_all(s,1:size(means{1,s},2)),means{1,s},'LineWidth', 3)
hold on
end
plot(times_all(1,1:48),mean(1:48), ':', 'Color', [0,0,0], 'LineWidth',3) %average
ylabel('Pearson Correlation (r)');
xlabel('Time (Minutes)');
plot(times_all(1,1:29),mean(1:29), ':', 'Color', [0,0,0], 'LineWidth',3) %average
ylabel('Pearson Correlation (r)');
xlabel('Time (Minutes)');
clear gcf
figure;
for s = 1:numel(subject)
plot(times_all(s,1:size(means{1,s},2)),means{1,s},'LineWidth', 3)
hold on
end
plot(times_all(4,1:29),mean(1:29), ':', 'Color', [0,0,0], 'LineWidth',3)
plot(times_all(4,1:26),mean(1:26), ':', 'Color', [0,0,0], 'LineWidth',3)
clear gcf
figure;
for s = 1:numel(subject)
plot(times_all(s,1:size(means{1,s},2)),means{1,s},'LineWidth', 3)
hold on
end
plot(times_all(4,1:26),mean(1:26), ':', 'Color', [0,0,0], 'LineWidth',3)
close gcf
figure;
for s = 1:numel(subject)
plot(times_all(s,1:size(means{1,s},2)),means{1,s},'LineWidth', 3)
hold on
end
plot(times_all(4,1:25),mean(1:25), ':', 'Color', [0,0,0], 'LineWidth',3)
ylabel('Pearson Correlation (r)');
xlabel('Time (Minutes)');
ax = gca;
ax.FontSize = 24;
print(gcf,['/Volumes/RESEARCH_HD/Lifespan/CNS_Analyses/ReliabilityiNETRestDatatruhalf'↙
num2str(pts2sample) '.jpg'],'-dpng','-r300');
print(gcf,['/Users/dianaperez/Desktop/ReliabilityiNETRestDatatruhalf' num2str(pts2sample)↙
'.jpg'],'-dpng','-r300');
similarity_analysis_forced_same_amt_data
hline_new([0,4,8,12,16,20,24,28,32]+0.5,'k',2);
hline_new([0,5,10,15,20,25,30,35,40,44,48]+0.5,'k',2);
figure('Position',[1 1 1000 800]);
imagesc(simmat,[0 1]); colormap('jet');
hline_new([0,4,8,12,16,20,24,28,32,36,40]+0.5,'k',2);
vline_new([0,4,8,12,16,20,24,28,32,36,40]+0.5,'k',2);
axis square;
colorbar;
title('Correlation Matrix Similarity');
set(gca,'XTick',[2,6,10,14,18,22,26,30,34,38], 'YTick', [2,6,10,14,18,22,26,30,34,38],↙
'XTickLabel',...
{'INET001','INET002',↙
'INET003','INET005','INET006','INET010','INET016','INET018','INET019','INET030'},↙
'YTickLabel', {'INET001','INET002',↙
'INET003','INET005','INET006','INET010','INET016','INET018','INET019','INET030'})
ax = gca;
ax.FontSize = 20
ax.FontSize = 18
```

```
ax.FontSize = 16
ax.FontSize = 14
saveas(gcf,'/Users/dianaperez/Desktop/iNet_SimilarityMat_rest.tiff','tiff')
%-- 5/21/22, 7:34 PM --%
var_freq_size_net
addpath '/Users/dianaperez/Documents/Dependencies/cifti-matlab-master'
var_freq_size_net
[data_location num2str(subs{g,1}(n)) netAssign_str]
var_freq_size_net
network_names = {'DMN'  'Vis'   'FP'    'DAN'   'Lang'  'Sal'   'CO'    'SMd'   'SMl'↙
'Aud'   'Tpole' 'MTL'   'PMN'   'PON'};
good_nets_LH = [networksxHem.verticesLH(:,1:3) networksxHem.verticesLH(:,5) networksxHem.↙
verticesLH(:,7:end)];
good_nets_RH = [networksxHem.verticesRH(:,1:3) networksxHem.verticesRH(:,5) networksxHem.↙
verticesRH(:,7:end)];
good_nets_LH = mean(good_nets_LH);
good_nets_RH = mean(good_nets_RH);
means = [good_nets_LH' good_nets_RH'];
bar(1:14, means)
network_names = {'DMN'  'Vis'   'FP'    'DAN'   'Lang'  'Sal'   'CO'    'SMd'   'SMl'↙
'Aud'   'Tpole' 'MTL'   'PMN'   'PON'};
good_nets_LH = [networksxHem.verticesLH(:,1:3) networksxHem.verticesLH(:,5) networksxHem.↙
verticesLH(:,7:end)];
good_nets_RH = [networksxHem.verticesRH(:,1:3) networksxHem.verticesRH(:,5) networksxHem.↙
verticesRH(:,7:end)];
good_nets_LH = mean(good_nets_LH);
good_nets_RH = mean(good_nets_RH);
means = [good_nets_LH' good_nets_RH'];
b = bar(1:14, means)
b(1) = [1,1,1];
b(1).FaceColor = [1,1,1];
b(1).FaceColor = [0,0,0];
b(2).FaceColor = [17,17,17];
b(2).FaceColor = [.5,.5,.5];
legend('Left Handers', 'Right Handers')
xticks(1:14)
xticklabels(network_names)
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.5, 0.7, 0.9, 0.7]);
ylabel('Average Number of Variant vertices');
xlabel('Network');
perms_var_freq_size
permute_net_assignment
root_dir = '/Users/dianaperez/Desktop/Research/Lateralization/lateralization_code/'; %↙
location of code directory
data_location = [root_dir 'testing_output/'];
LHand_info = load([data_location 'HCP752_LH_networksxHem.mat']);
RHand_info = load([data_location 'HCP752_RH_networksxHem.mat']);
%plot left-handers
clear all
root_dir = '/Users/dianaperez/Desktop/Research/Lateralization/lateralization_code/'; %↙
location of code directory
data_location = [root_dir 'testing_output/'];
LHand_info = load([data_location 'HCP752_LH_networksxHem.mat']);
RHand_info = load([data_location 'HCP752_RH_networksxHem.mat']);
%plot left-handers
lh_numvars = mean(LHand_info.networksxHem.clustersLH,1);
rh_numvars = mean(LHand_info.networksxHem.clustersRH,1);
for net = 1:16
se_lh(net) = std(LHand_info.networksxHem.clustersLH(:,net))/sqrt(40);
se_rh(net) = std(LHand_info.networksxHem.clustersRH(:,net))/sqrt(40);
```

```
end
h = errorbar(lh_numvars, rh_numvars, se_rh, se_rh, se_lh, se_lh, 'o')
h.Color = [0,0,0];
clear al
clear all
root_dir = '/Users/dianaperez/Desktop/Research/Lateralization/lateralization_code/'; %↙
location of code directory
data_location = [root_dir 'testing_output/'];
LHand_info = load([data_location 'HCP752_LH_networksxHem.mat']);
RHand_info = load([data_location 'HCP752_RH_networksxHem.mat']);
%plot left-handers
Lhand_lh_numvars = mean(LHand_info.networksxHem.clustersLH,1);
Lhand_rh_numvars = mean(LHand_info.networksxHem.clustersRH,1);
Lhand_diff_numvars = Lhand_lh_numvars-Lhand_rh_numvars;
clear all
load↙
('/Users/dianaperez/Desktop/Research/lateralization_code/testing_output/HCP752_new_split_↙
LH_networksxHem.mat')
network_names = {'DMN'  'Vis'   'FP'    'DAN'   'Lang'  'Sal'   'CO'    'SMd'   'SMl'↙
'Aud'   'Tpole' 'MTL'   'PMN'   'PON'};
load↙
('/Users/dianaperez/Desktop/Research/Lateralization/lateralization_code/testing_output/HC↙
P752_new_split_LH_networksxHem.mat')
network_names = {'DMN'  'Vis'   'FP'    'DAN'   'Lang'  'Sal'   'CO'    'SMd'   'SMl'↙
'Aud'   'Tpole' 'MTL'   'PMN'   'PON'};
good_nets_LH = [networksxHem.verticesLH(:,1:3) networksxHem.verticesLH(:,5) networksxHem.↙
verticesLH(:,7:end)];
good_nets_LH = [networksxHem.clustersLH(:,1:3) networksxHem.clustersLH(:,5) networksxHem.↙
clustersLH(:,7:end)];
good_nets_RH = [networksxHem.clustersRH(:,1:3) networksxHem.clustersRH(:,5) networksxHem.↙
clustersRH(:,7:end)];
good_nets_LH = mean(good_nets_LH);
good_nets_RH = mean(good_nets_RH);
means = [good_nets_LH' good_nets_RH'];
for net = 1:16
se_lh(net) = std(networksxHem.clustersLH(:,net))/sqrt(40);
se_rh(net) = std(networksxHem.clustersRH(:,net))/sqrt(40);
end
se_lh(4) = [];
se_lh(5) = [];
se_rh(4) = [];
se_rh(5) = [];
bar(1:14, means)
legend('Left Hem', 'Right Hem')
xticks(1:14)
xticklabels(network_names)
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.5, 0.7, 0.9, 0.7]);
ylabel('Average Number of Variant Regions')
xlabel('Network');
title('Variant Regions Assigned to Each Network Across Hemispheres')
ax = gca;
ax.FontSize = 24;
hold on
h = errorbar(.85:1:13.85, means(:,1), se_lh, se_lh)
h.Color = [0,0,0];
g = errorbar(1.15:1:14.15, means(:,2), se_rh, se_rh)
g.Color = [0,0,0];
h.LineStyle = 'none';
g.LineStyle = 'none';
h.LineWidth = 2;
```

```
g.LineWidth = 2;
legend('Left Hem', 'Right Hem')
close gcf
left_handers = networksxHem;
load↙
('/Users/dianaperez/Desktop/Research/lateralization_code/testing_output/HCP752_RH_network↙
sxHem.mat')
network_names = {'DMN'  'Vis'   'FP'    'DAN'   'Lang'  'Sal'   'CO'    'SMd'   'SMl'↙
'Aud'   'Tpole' 'MTL'   'PMN'   'PON'};
good_nets_LH = [networksxHem.verticesLH(:,1:3) networksxHem.verticesLH(:,5) networksxHem.↙
verticesLH(:,7:end)];
good_nets_LH = [networksxHem.clustersLH(:,1:3) networksxHem.clustersLH(:,5) networksxHem.↙
clustersLH(:,7:end)];
good_nets_RH = [networksxHem.clustersRH(:,1:3) networksxHem.clustersRH(:,5) networksxHem.↙
clustersRH(:,7:end)];
good_nets_LH = mean(good_nets_LH);
good_nets_RH = mean(good_nets_RH);
means = [good_nets_LH' good_nets_RH'];
for net = 1:16
se_lh(net) = std(networksxHem.clustersLH(:,net))/sqrt(670);
se_rh(net) = std(networksxHem.clustersRH(:,net))/sqrt(670);
end
se_lh(4) = [];
se_lh(5) = [];
se_rh(4) = [];
se_rh(5) = [];
bar(1:14, means)
legend('Left Hem', 'Right Hem')
xticks(1:14)
xticklabels(network_names)
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.5, 0.7, 0.9, 0.7]);
ylabel('Average Number of Variant Regions')
xlabel('Network');
title('Variant Regions Assigned to Each Network Across Hemispheres')
ax = gca;
ax.FontSize = 24;
hold on
h = errorbar(.85:1:13.85, means(:,1), se_lh, se_lh)
h.Color = [0,0,0];
g = errorbar(1.15:1:14.15, means(:,2), se_rh, se_rh)
g.Color = [0,0,0];
h.LineStyle = 'none';
g.LineStyle = 'none';
h.LineWidth = 2;
g.LineWidth = 2;
legend('Left Hem', 'Right Hem')
axis([0,15,0,2.5])
load↙
('/Users/dianaperez/Desktop/Research/Lateralization/lateralization_code/testing_output/HC↙
P752_RH_networksxHem.mat')
network_names = {'DMN'  'Vis'   'FP'    'DAN'   'Lang'  'Sal'   'CO'    'SMd'   'SMl'↙
'Aud'   'Tpole' 'MTL'   'PMN'   'PON'};
good_nets_LH = [networksxHem.verticesLH(:,1:3) networksxHem.verticesLH(:,5) networksxHem.↙
verticesLH(:,7:end)];
good_nets_LH = [networksxHem.clustersLH(:,1:3) networksxHem.clustersLH(:,5) networksxHem.↙
clustersLH(:,7:end)];
good_nets_RH = [networksxHem.clustersRH(:,1:3) networksxHem.clustersRH(:,5) networksxHem.↙
clustersRH(:,7:end)];
good_nets_LH = mean(good_nets_LH);
good_nets_RH = mean(good_nets_RH);
```

```
means = [good_nets_LH' good_nets_RH'];
for net = 1:16
se_lh(net) = std(networksxHem.clustersLH(:,net))/sqrt(670);
se_rh(net) = std(networksxHem.clustersRH(:,net))/sqrt(670);
end
se_lh(4) = [];
se_lh(5) = [];
se_rh(4) = [];
se_rh(5) = [];
bar(1:14, means)
legend('Left Hem', 'Right Hem')
xticks(1:14)
xticklabels(network_names)
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.5, 0.7, 0.9, 0.7]);
ylabel('Average Number of Variant Regions')
xlabel('Network');
title('Variant Regions Assigned to Each Network Across Hemispheres')
ax = gca;
ax.FontSize = 24;
hold on
h = errorbar(.85:1:13.85, means(:,1), se_lh, se_lh)
h.Color = [0,0,0];
g = errorbar(1.15:1:14.15, means(:,2), se_rh, se_rh)
g.Color = [0,0,0];
h.LineStyle = 'none';
g.LineStyle = 'none';
h.LineWidth = 2;
g.LineWidth = 2;
legend('Left Hem', 'Right Hem')
axis([0,15,0,2.5])
close gcf
right_handers = networksxHem;
diff_lefthanders = left_handers.clustersLH - left_handers.clustersRH;
mean_diff_lefthanders = mean(diff_lefthanders, 1);
diff_righthanders = right_handers.clustersLH - right_handers.clustersRH;
mean_diff_righthanders = mean(diff_righthanders, 1);
for net = 1:16
se_lh(net) = std(diff_lefthanders(:,net))/sqrt(40);
se_rh(net) = std(diff_righthanders(:,net))/sqrt(670);
end
se_lh(4) = [];
se_lh(5) = [];
se_rh(4) = [];
se_rh(5) = [];
diffs = [mean_diff_lefthanders; mean_diff_righthanders];
diffs(:,4) = []; diffs(:,5) = [];
b = bar(1:14, diffs)
b(1).FaceColor = [0,0,0];%[.2 .6 .5];
b(2).FaceColor = [.5,.5,.5];%[0.4940 0.1840 0.5560];
legend('Left Handers', 'Right Handers')
xticks(1:14)
xticklabels(network_names)
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.5, 0.7, 0.9, 0.7]);
ylabel(' ')
xlabel(' ');
ax = gca;
ax.FontSize = 24;
hold on
h = errorbar(.85:1:13.85, diffs(1,:), se_lh, se_lh)
h.Color = [0,0,0];
```

```
g = errorbar(1.15:1:14.15, diffs(2,:), se_rh, se_rh)
g.Color = [0,0,0];
h.LineStyle = 'none';
g.LineStyle = 'none';
h.LineWidth = 2;
g.LineWidth = 2;
legend('Left Handers', 'Right Handers')
h = errorbar(.85:1:13.85, diffs(1,:), [], se_lh)
h.Color = [1,1,1];
close gcf
diff_lefthanders = left_handers.clustersLH - left_handers.clustersRH;
mean_diff_lefthanders = mean(diff_lefthanders, 1);
diff_righthanders = right_handers.clustersLH - right_handers.clustersRH;
mean_diff_righthanders = mean(diff_righthanders, 1);
for net = 1:16
se_lh(net) = std(diff_lefthanders(:,net))/sqrt(40);
se_rh(net) = std(diff_righthanders(:,net))/sqrt(670);
end
se_lh(4) = [];
se_lh(5) = [];
se_rh(4) = [];
se_rh(5) = [];
diffs = [mean_diff_lefthanders; mean_diff_righthanders];
diffs(:,4) = []; diffs(:,5) = [];
b = bar(1:14, diffs)
b(1).FaceColor = [0,0,0];%[.2 .6 .5];
b(2).FaceColor = [.5,.5,.5];%[0.4940 0.1840 0.5560];
legend('Left Handers', 'Right Handers')
xticks(1:14)
xticklabels(network_names)
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.5, 0.7, 0.9, 0.7]);
ylabel(' ')
xlabel(' ');
ax = gca;
ax.FontSize = 24;
hold on
h = errorbar(.85:1:13.85, diffs(1,:), se_lh, se_lh)
h.Color = [0,0,0];
g = errorbar(1.15:1:14.15, diffs(2,:), se_rh, se_rh)
g.Color = [0,0,0];
h.LineStyle = 'none';
g.LineStyle = 'none';
h.LineWidth = 2;
g.LineWidth = 2;
legend('Left Handers', 'Right Handers')
h = errorbar(.85:1:13.85, diffs(1,:), se_lh, se_lh)
h.Color = [1,1,1];
close gcf
diff_lefthanders = left_handers.clustersLH - left_handers.clustersRH;
mean_diff_lefthanders = mean(diff_lefthanders, 1);
diff_righthanders = right_handers.clustersLH - right_handers.clustersRH;
mean_diff_righthanders = mean(diff_righthanders, 1);
for net = 1:16
se_lh(net) = std(diff_lefthanders(:,net))/sqrt(40);
se_rh(net) = std(diff_righthanders(:,net))/sqrt(670);
end
se_lh(4) = [];
se_lh(5) = [];
se_rh(4) = [];
se_rh(5) = [];
```

```
diffs = [mean_diff_lefthanders; mean_diff_righthanders];
diffs(:,4) = []; diffs(:,5) = [];
b = bar(1:14, diffs)
b(1).FaceColor = [0,0,0];%[.2 .6 .5];
b(2).FaceColor = [.5,.5,.5];%[0.4940 0.1840 0.5560];
legend('Left Handers', 'Right Handers')
xticks(1:14)
xticklabels(network_names)
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.5, 0.7, 0.9, 0.7]);
ylabel(' ')
xlabel(' ');
ax = gca;
ax.FontSize = 24;
hold on
h = errorbar(.85:1:13.85, diffs(1,:), se_lh, se_lh)
h.Color = [0,0,0];
g = errorbar(1.15:1:14.15, diffs(2,:), se_rh, se_rh)
g.Color = [0,0,0];
h.LineStyle = 'none';
g.LineStyle = 'none';
h.LineWidth = 2;
g.LineWidth = 2;
legend('Left Handers', 'Right Handers')
close gcf
diff_lefthanders = left_handers.clustersLH - left_handers.clustersRH;
mean_diff_lefthanders = mean(diff_lefthanders, 1);
diff_righthanders = right_handers.clustersLH - right_handers.clustersRH;
mean_diff_righthanders = mean(diff_righthanders, 1);
for net = 1:16
se_lh(net) = std(diff_lefthanders(:,net))/sqrt(40);
se_rh(net) = std(diff_righthanders(:,net))/sqrt(670);
end
se_lh(4) = [];
se_lh(5) = [];
se_rh(4) = [];
se_rh(5) = [];
diffs = [mean_diff_lefthanders; mean_diff_righthanders];
diffs(:,4) = []; diffs(:,5) = [];
b = bar(1:14, diffs)
b(1).FaceColor = [0,0,0];%[.2 .6 .5];
b(2).FaceColor = [.5,.5,.5];%[0.4940 0.1840 0.5560];
legend('Left Handers', 'Right Handers')
xticks(1:14)
xticklabels(network_names)
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.5, 0.7, 0.9, 0.7]);
ylabel(' ')
xlabel(' ');
ax = gca;
ax.FontSize = 24;
hold on
h = errorbar(.85:1:13.85, diffs(1,:), se_lh, se_lh)
h.Color = [0.5,0.5,0.5];
g = errorbar(1.15:1:14.15, diffs(2,:), se_rh, se_rh)
g.Color = [0,0,0];
h.LineStyle = 'none';
g.LineStyle = 'none';
h.LineWidth = 2;
g.LineWidth = 2;
legend('Left Handers', 'Right Handers')
print(gcf, '/Users/dianaperez/Desktop/HCP752_numvars_LvRhand_L-Rhem.jpg', '-dpng', '-↙
```

```
r300')
%-- 5/26/22, 6:43 PM --%
help rand
help datasample
randperm
help randperm
for i = 1:100000000000000
mat(i) = randperm([0,1], 1);
end
for i = 1:100000000000000
mat(i) = randn([0,1], 1);
end
help randn
for i = 1:10
mat(i) = datasample([0,1], 1);
end
sum(mat)/length(mat)
for i = 1:10
mat(i) = datasample([0,1], 1);
end
for i = 1:1000000000000000000
mat(i) = datasample([0,1], 1);
end
sum(mat)/length(mat)
for i = 1:1000000000
mat(i) = datasample([0,1], 1);
end
sum(mat)/length(mat)
sum(mat)/length(mat)
%-- 6/6/22, 3:23 PM --%
ismac
ispc
islinux
IsLinux
isunix
path1 = '/Users/dianaperez/Desktop/';
if ismac
path2 = replace('\', path1, '/');
elseif ispc
path2 = replace('/', path1, '\');
end
if ispc
path2 = replace('\', path1, '/');
elseif ismac
path2 = replace('/', path1, '\');
end
if ispc
path2 = replace(path1, '\', '/');
elseif ismac
path2 = replace(path1, '/', '\');
end
perms_var_freq_size
permute_net_assignment
[p_fdr, p_masked] = fdr([0.00004373 0.00000249  0.7522832   0.03489360  0.00000000↙
0.26316159  0.00762987  0.41333184  0.00000029  0.11045880  0.02515492  0.03078876↙
0.63493542], 0.025)
[p_fdr, p_masked] = FDR([0.00004373 0.00000249  0.7522832   0.03489360  0.00000000↙
0.26316159  0.00762987  0.41333184  0.00000029  0.11045880  0.02515492  0.03078876↙
0.63493542], 0.025)
[p_fdr, p_masked] = FDR([0.004405384    0.0000000004045834881115↙
```

```
0.0000000000000000000001], 0.025)
cd /Users/dianaperez/Desktop
cd MSC_variants
ft_read_cifti_mod('Templatematch_spCorr_bysubject_IDs_reassigned.dtseries.nii')
addpath '/Users/dianaperez/Documents/Dependencies/cifti-matlab-master'
ft_read_cifti_mod('Templatematch_spCorr_bysubject_IDs_reassigned.dtseries.nii')
clear all
ft_read_cifti_mod('Templatematch_spCorr_bysubject_IDs_reassigned.dtseries.nii')
MSC_vars = ans;
unique(MSC_vars.data(:,1))
unique(MSC_vars.data(:,2))
unique(MSC_vars.data(:,3))
unique(MSC_vars.data(:,4))
unique(MSC_vars.data(:,7))
template = ft_read_cifti_mod('MSC08_topVariants_binary_corr<0.3.dtseries.nii')
template.data = MSC_vars.data(:,1);
unique(template.data)
ft_write_cifti_mod('MSC01_variants_reassigned.dtseries.nii', template)
template.data = MSC_vars.data(:,2);
ft_write_cifti_mod('MSC02_variants_reassigned.dtseries.nii', template)
unique(template.data)
template.data = MSC_vars.data(:,3);
unique(template.data)
ft_write_cifti_mod('MSC03_variants_reassigned.dtseries.nii', template)
template.data = MSC_vars.data(:,4);
unique(template.data)
ft_write_cifti_mod('MSC04_variants_reassigned.dtseries.nii', template)
template.data = MSC_vars.data(:,5);
unique(template.data)
ft_write_cifti_mod('MSC05_variants_reassigned.dtseries.nii', template)
template.data = MSC_vars.data(:,6);
unique(template.data)
ft_write_cifti_mod('MSC06_variants_reassigned.dtseries.nii', template)
template.data = MSC_vars.data(:,7);
ft_write_cifti_mod('MSC07_variants_reassigned.dtseries.nii', template)
template.data = MSC_vars.data(:,8);
ft_write_cifti_mod('MSC09_variants_reassigned.dtseries.nii', template)
template.data = MSC_vars.data(:,9);
ft_write_cifti_mod('MSC10_variants_reassigned.dtseries.nii', template)
clear all
segregation_ind_by_net
cd '/Users/dianaperez/Documents/GitHub/GrattonLab-General-Repo/FCProcess'
addpath '/Users/dianaperez/Documents/GitHub/GrattonLab-General-Repo/FCProcess'
segregation_ind_by_net
output_dir = '/Users/dianaperez/Desktop/Research/Segregation_Analyses/';
save([output_dir subs{sub} '_seg_index_net_withNaNnegs.mat'], 'sub_struct')
segregation_ind_by_net
segregation_ind_by_ses
segregation_ind_by_sub
segregation_ind_by_ses
segregation_ind_by_net
clear all
load↙
('/Users/dianaperez/Desktop/Research/Segregation_Analyses/INET019_seg_index_net_withNaNne↙
gs.mat')
load↙
('/Users/dianaperez/Desktop/Research/Segregation_Analyses/INET018_seg_index_net_withNaNne↙
gs.mat')
load↙
('/Users/dianaperez/Desktop/Research/Segregation_Analyses/INET016_seg_index_net_withNaNne↙
```

```
gs.mat')
load↙
('/Users/dianaperez/Desktop/Research/Segregation_Analyses/INET010_seg_index_net_withNaNne↙
gs.mat')
load↙
('/Users/dianaperez/Desktop/Research/Segregation_Analyses/INET006_seg_index_net_withNaNne↙
gs.mat')
load↙
('/Users/dianaperez/Desktop/Research/Segregation_Analyses/INET005_seg_index_net_withNaNne↙
gs.mat')
load↙
('/Users/dianaperez/Desktop/Research/Segregation_Analyses/INET003_seg_index_net_withNaNne↙
gs.mat')
load↙
('/Users/dianaperez/Desktop/Research/Segregation_Analyses/INET002_seg_index_net_withNaNne↙
gs.mat')
load↙
('/Users/dianaperez/Desktop/Research/Segregation_Analyses/INET001_seg_index_net_withNaNne↙
gs.mat')
segregation_ind_by_net
load↙
('/Users/dianaperez/Desktop/Research/Segregation_Analyses/LS17_seg_index_net_withNaNnegs.↙
mat')
load↙
('/Users/dianaperez/Desktop/Research/Segregation_Analyses/LS16_seg_index_net_withNaNnegs.↙
mat')
load↙
('/Users/dianaperez/Desktop/Research/Segregation_Analyses/LS14_seg_index_net_withNaNnegs.↙
mat')
load↙
('/Users/dianaperez/Desktop/Research/Segregation_Analyses/LS11_seg_index_net_withNaNnegs.↙
mat')
load↙
('/Users/dianaperez/Desktop/Research/Segregation_Analyses/LS08_seg_index_net_withNaNnegs.↙
mat')
load↙
('/Users/dianaperez/Desktop/Research/Segregation_Analyses/LS05_seg_index_net_withNaNnegs.↙
mat')
load↙
('/Users/dianaperez/Desktop/Research/Segregation_Analyses/LS03_seg_index_net_withNaNnegs.↙
mat')
load↙
('/Users/dianaperez/Desktop/Research/Segregation_Analyses/LS02_seg_index_net_withNaNnegs.↙
mat')
load↙
('/Users/dianaperez/Desktop/Research/Segregation_Analyses/INET030_seg_index_net_with0negs↙
.mat')
load↙
('/Users/dianaperez/Desktop/Research/Segregation_Analyses/INET019_seg_index_net_with0negs↙
.mat')
load↙
('/Users/dianaperez/Desktop/Research/Segregation_Analyses/INET018_seg_index_net_with0negs↙
.mat')
load↙
('/Users/dianaperez/Desktop/Research/Segregation_Analyses/INET016_seg_index_net_with0negs↙
.mat')
load↙
('/Users/dianaperez/Desktop/Research/Segregation_Analyses/INET010_seg_index_net_with0negs↙
.mat')
load↙
```

```
('/Users/dianaperez/Desktop/Research/Segregation_Analyses/INET006_seg_index_net_with0negs↙
.mat')
load↙
('/Users/dianaperez/Desktop/Research/Segregation_Analyses/INET005_seg_index_net_with0negs↙
.mat')
load↙
('/Users/dianaperez/Desktop/Research/Segregation_Analyses/INET003_seg_index_net_with0negs↙
.mat')
load↙
('/Users/dianaperez/Desktop/Research/Segregation_Analyses/INET002_seg_index_net_with0negs↙
.mat')
load↙
('/Users/dianaperez/Desktop/Research/Segregation_Analyses/INET001_seg_index_net_with0negs↙
.mat')
load↙
('/Users/dianaperez/Desktop/Research/Segregation_Analyses/LS17_seg_index_net_with0negs.↙
mat')
load↙
('/Users/dianaperez/Desktop/Research/Segregation_Analyses/LS16_seg_index_net_with0negs.↙
mat')
load↙
('/Users/dianaperez/Desktop/Research/Segregation_Analyses/LS14_seg_index_net_with0negs.↙
mat')
load↙
('/Users/dianaperez/Desktop/Research/Segregation_Analyses/LS11_seg_index_net_with0negs.↙
mat')
load↙
('/Users/dianaperez/Desktop/Research/Segregation_Analyses/LS08_seg_index_net_with0negs.↙
mat')
load↙
('/Users/dianaperez/Desktop/Research/Segregation_Analyses/LS05_seg_index_net_with0negs.↙
mat')
load↙
('/Users/dianaperez/Desktop/Research/Segregation_Analyses/LS03_seg_index_net_with0negs.↙
mat')
load↙
('/Users/dianaperez/Desktop/Research/Segregation_Analyses/LS02_seg_index_net_with0negs.↙
mat')
load↙
('/Users/dianaperez/Desktop/Research/Segregation_Analyses/INET_allsubs_seg_index_ses_with↙
NaNnegs.mat')
load↙
('/Users/dianaperez/Desktop/Research/Segregation_Analyses/INET_allsubs_seg_index_ses_with↙
0negs.mat')
clear all
segregation_ind_by_ses
load('/Users/dianaperez/Desktop/Research/Segregation_Analyses/allsubs_seg_index_ses.mat')
segregation_ind_by_ses
load↙
('/Users/dianaperez/Desktop/Research/Segregation_Analyses/LS_allsubs_seg_index_sub_with0n↙
eg.mat')
load↙
('/Users/dianaperez/Desktop/Research/Segregation_Analyses/LS_allsubs_seg_index_sub_withNa↙
Nneg.mat')
load↙
('/Users/dianaperez/Desktop/Research/Segregation_Analyses/INET_allsubs_seg_index_sub_with↙
0neg.mat')
load↙
('/Users/dianaperez/Desktop/Research/Segregation_Analyses/INET_allsubs_seg_index_sub_with↙
NaNneg.mat')
```

```
scatter(sub_SI)
scatter(sub_SI, length(sub_SI))
length(sub_SI)
help scatter
scatter(length(sub_SI), sub_SI)
sub_SI
scatter(length(sub_SI), sub_SI')
scatter(10, sub_SI')
scatter(10, sub_SI)
plot(10, sub_SI)
plot(1:10, sub_SI)
scatter(1:10, sub_SI)
clear all
load↙
('/Users/dianaperez/Desktop/Research/Segregation_Analyses/INET_allsubs_seg_index_sub_with↙
NaNneg.mat')
iNet_SI =  sub_SI';
load↙
('/Users/dianaperez/Desktop/Research/Segregation_Analyses/LS_allsubs_seg_index_sub_withNa↙
Nneg.mat')
lifespan_SI = sub_SI';
iNet_SI(5,:) = -1;
load↙
('/Users/dianaperez/Desktop/Research/Segregation_Analyses/INET_allsubs_seg_index_sub_with↙
NaNneg.mat')
iNet_SI =  sub_SI';
lifespan_SI(9) = -1;
lifespan_SI(10) = -1;
handles = plotSpread([lifespan_SI iNet_SI], 'distributionMarkers', {'o'}, 'xNames',↙
{'YA', 'OA'}, 'binWidth', 1)
handles = plotSpread([lifespan_SI iNet_SI], 'xNames', {'YA', 'OA'}, 'binWidth', 1)
load↙
('/Users/dianaperez/Desktop/Research/Segregation_Analyses/INET_allsubs_seg_index_sub_with↙
NaNneg.mat')
iNet_SI =  sub_SI';
load↙
('/Users/dianaperez/Desktop/Research/Segregation_Analyses/LS_allsubs_seg_index_sub_withNa↙
Nneg.mat')
lifespan_SI = sub_SI';
% lifespan_SI(9) = -1;
% lifespan_SI(10) = -1;
ind=[1,1,1,1,1,1,1,1,1,1,0,0,0,0,0,0,0,0];
handles = plotSpread([iNet_SI; lifespan_SI], 'xNames', {'YA', 'OA'}, 'binWidth', 1)
handles = plotSpread([iNet_SI; lifespan_SI], 'xNames', {'YA', 'OA'},↙
'distributionColors', {'b', 'r'},'binWidth', 1)
ind=[1,1,1,1,1,1,1,1,1,1,2,2,2,2,2,2,2,2];
handles = plotSpread([iNet_SI; lifespan_SI], 'distributionIdx', ind,'xNames', {'YA',↙
'OA'}, 'distributionColors', {'b', 'r'},'binWidth', 1)
handles = plotSpread([iNet_SI; lifespan_SI], 'distributionIdx',↙
ind,'distributionMarkers', {'o'},'xNames', {'YA', 'OA'}, 'distributionColors', {'b',↙
'r'},'binWidth', 1)
handles = plotSpread([iNet_SI; lifespan_SI], 'distributionIdx',↙
ind,'distributionMarkers', {'x'},'xNames', {'YA', 'OA'}, 'distributionColors', {'b',↙
'r'},'binWidth', 1)
load↙
('/Users/dianaperez/Desktop/Research/Segregation_Analyses/INET_allsubs_seg_index_sub_with↙
0neg.mat')
iNet_SI =  sub_SI';
load↙
('/Users/dianaperez/Desktop/Research/Segregation_Analyses/LS_allsubs_seg_index_sub_with0n↙
```

```
eg.mat')
lifespan_SI = sub_SI';
handles = plotSpread([iNet_SI; lifespan_SI], 'distributionIdx',↙
ind,'distributionMarkers', {'o'},'xNames', {'YA', 'OA'}, 'distributionColors', {'b',↙
'r'},'binWidth', 1)
handles = plotSpread([iNet_SI; lifespan_SI], 'distributionIdx',↙
ind,'distributionMarkers', {'o'},'xNames', {'YA', 'OA'}, 'distributionColors', {'b',↙
'r'},'binWidth', 1)
ax = gca;
ax.FontSize = 24;
m = findobj(gca, 'Type', 'Scatter')
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.3, 0.7]); %first and second↙
control position on screen, third controls width, and fourth controls height
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.3, 0.8]); %first and second↙
control position on screen, third controls width, and fourth controls height
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0, 0.8]); %first and second↙
control position on screen, third controls width, and fourth controls height
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.8, 0.8]); %first and second↙
control position on screen, third controls width, and fourth controls height
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.3, 0.7]); %first and second↙
control position on screen, third controls width, and fourth controls height
axis([0, 3, 0, 1])
axis([0, 3, 0.3, .8])
print(gcf, '/Users/dianaperez/Desktop/SI_by_sub_NanVs0.jpg', '-dpng', '-r300')
load('/Users/dianaperez/Desktop/Research/Segregation_Analyses/allsubs_seg_index_ses.mat')
lifespan_SI = ses_SI;
load('/Users/dianaperez/Desktop/Research/Segregation_Analyses/INET_allsubs_seg_index_ses.↙
mat')
INET_SI(:,5) = -1;
INET_SI = ses_SI;
INET_SI(:,5) = -1;
ind=[1,1,1,1,1,1,1,1,1,1,2,2,2,2,2,2,2,2];
subs = {'LS02', 'LS03', 'LS05', 'LS08', 'LS11', 'LS14',↙
'LS16','LS17','INET001','INET002',↙
'INET003','INET005','INET006','INET010','INET016','INET018','INET019','INET030'};
subs = {'INET001','INET002',↙
'INET003','INET005','INET006','INET010','INET016','INET018','INET019','INET030', 'LS02',↙
'LS03', 'LS05', 'LS08', 'LS11', 'LS14', 'LS16','LS17'};
handles = plotSpread([iNet_SI; lifespan_SI], 'distributionIdx',↙
ind,'distributionMarkers', {'o'},'xNames', {'YA', 'OA'}, 'distributionColors', {'b',↙
'r'},'binWidth', 1)
load('/Users/dianaperez/Desktop/Research/Segregation_Analyses/allsubs_seg_index_ses.mat')
lifespan_SI = ses_SI;
load('/Users/dianaperez/Desktop/Research/Segregation_Analyses/INET_allsubs_seg_index_ses.↙
mat')
iNet_SI = ses_SI;
iNet_SI(:,5) = -1;
[iNet_SI; lifespan_SI]
handles = plotSpread([iNet_SI; lifespan_SI], 'distributionIdx',↙
ind,'distributionMarkers', {'x'},'xNames', subs, 'distributionColors', {'b',↙
'r'},'binWidth', 1)
handles = plotSpread([iNet_SI; lifespan_SI])
figure; handles = plotSpread([iNet_SI; lifespan_SI]')
figure; handles = plotSpread([iNet_SI; lifespan_SI]','distributionIdx', ind)
ind
figure; handles = plotSpread([iNet_SI; lifespan_SI]', 'distributionIdx', [ind;ind;ind;↙
ind;ind])
[ind;ind;ind;ind;ind]
[iNet_SI; lifespan_SI]'
figure; handles = plotSpread([iNet_SI; lifespan_SI]')
```

```
figure; handles = plotSpread([iNet_SI; lifespan_SI]', 'categoryIdx',↙
ind,'categorynMarkers', {'x'},'xNames', subs, 'categoryColors', {'b', 'r'},'binWidth', 1)
handles = plotSpread([iNet_SI; lifespan_SI]', 'categoryIdx', ind,'categoryMarkers',↙
{'x'},'xNames', subs, 'categoryColors', {'b', 'r'},'binWidth', 1)
handles = plotSpread([iNet_SI; lifespan_SI]', 'categoryIdx', ind,'categoryMarkers',↙
{'x','x'},'xNames', subs, 'categoryColors', {'b', 'r'},'binWidth', 1)
handles = plotSpread([iNet_SI; lifespan_SI]', 'categoryIdx', [ind;ind;ind;ind;↙
ind],'categoryMarkers', {'x','x'},'xNames', subs, 'categoryColors', {'b',↙
'r'},'binWidth', 1)
subs = {'INET001','INET002',↙
'INET003','INET005','INET006','INET010','INET016','INET018','INET019','INET030', 'LS02',↙
'LS03', 'LS05', 'LS08', 'LS11', 'LS14', 'LS16','LS17'};
handles = plotSpread([iNet_SI; lifespan_SI]', 'categoryIdx', [ind;ind;ind;ind;↙
ind],'categoryMarkers', {'x'},'xNames', subs, 'categoryColors', {'b', 'r'},'binWidth', 1)
ax = gca;
ax.FontSize = 24;
axis([0, 3, 0.3, .8])
subs = {'INET001','INET002',↙
'INET003','INET005','INET006','INET010','INET016','INET018','INET019','INET030', 'LS02',↙
'LS03', 'LS05', 'LS08', 'LS11', 'LS14', 'LS16','LS17'};
handles = plotSpread([iNet_SI; lifespan_SI]', 'categoryIdx', [ind;ind;ind;ind;↙
ind],'categoryMarkers', {'x','x'},'xNames', subs, 'categoryColors', {'b',↙
'r'},'binWidth', 1)
ax = gca;
ax.FontSize = 24;
axis([0, 3, 0.3, .8])
axis([0, 3, 20, .8])
handles = plotSpread([iNet_SI; lifespan_SI]', 'categoryIdx', [ind;ind;ind;ind;↙
ind],'categoryMarkers', {'x','x'},'xNames', subs, 'categoryColors', {'b',↙
'r'},'binWidth', 1)
ax = gca;
ax.FontSize = 24;
axis([0, 20, .3, .8])
axis([0, 19, .3, .8])
axis([0, 18, .3, .8])
axis([0, 18.5, .3, .8])
axis([0.5, 18.5, .3, .8])
axis([0.5, 18.5, .1, .8])
axis([0.5, 18.5, .2, .6])
axis([0.5, 18.5, .3, .6])
axis([0.5, 18.5, .3, .55])
ax.FontSize = 20;
ax.FontSize = 24;
load↙
('/Users/dianaperez/Desktop/Research/Segregation_Analyses/LS_allsubs_seg_index_ses_with0n↙
egs.mat')
load↙
('/Users/dianaperez/Desktop/Research/Segregation_Analyses/INET_allsubs_seg_index_ses_with↙
0negs.mat')
load↙
('/Users/dianaperez/Desktop/Research/Segregation_Analyses/LS_allsubs_seg_index_ses_with0n↙
egs.mat')
lifespan_SI = ses_SI;
load↙
('/Users/dianaperez/Desktop/Research/Segregation_Analyses/INET_allsubs_seg_index_ses_with↙
0negs.mat')
iNet_SI = ses_SI;
iNet_SI(:,5) = -1;
handles = plotSpread([iNet_SI; lifespan_SI]', 'categoryIdx', [ind;ind;ind;ind;↙
ind],'categoryMarkers', {'o','o'},'xNames', subs, 'categoryColors', {'b',↙
```

```
'r'},'binWidth', 1)
axis([0.5, 18.5, .3, .8])
axis([0.5, 18.5, .3, .7])
print(gcf, '/Users/dianaperez/Desktop/SI_by_ses_NanVs0.jpg', '-dpng', '-r300')
load↙
('/Users/dianaperez/Desktop/Research/Segregation_Analyses/LS17_seg_index_net_withNaNnegs.↙
mat')
help contains
data = [];
for sub = 1:numel(subs)
load([subs(sub) '_seg_index_net_withNaNnegs.mat'])
sub_struct(15,:) = [];
if contains(subs(sub), 'INET')
sub_struct(:,5) = -1
end
data = [data; sub_struct];
end
data = [];
for sub = 1:numel(subs)
load([subs{sub} '_seg_index_net_withNaNnegs.mat'])
sub_struct(15,:) = [];
if contains(subs{sub}, 'INET')
sub_struct(:,5) = -1
end
data = [data; sub_struct];
end
data = [];
for sub = 1:numel(subs)
load(['/Users/dianaperez/Desktop/Research/Segregation_Analyses/' subs{sub}↙
'_seg_index_net_withNaNnegs.mat'])
sub_struct(15,:) = [];
if contains(subs{sub}, 'INET')
sub_struct(:,5) = -1
end
data = [data; sub_struct];
end
data = [];
for sub = 1:numel(subs)
load(['/Users/dianaperez/Desktop/Research/Segregation_Analyses/' subs{sub}↙
'_seg_index_net_withNaNnegs.mat'])
sub_struct.seg_ind(15,:) = [];
if contains(subs{sub}, 'INET')
sub_struct.seg_ind(:,5) = -1
end
data = [data; sub_struct.seg_ind];
end
data'
[1:14]*18
ind = [1:14];
ind = [ind;ind;ind;ind;ind;ind;ind;ind;ind;ind;ind;ind;ind;ind;ind;ind;ind;ind];
ind = [1:14]';
ind = [ind;ind;ind;ind;ind;ind;ind;ind;ind;ind;ind;ind;ind;ind;ind;ind;ind;ind];
help repmat
ind = repmat([1:14]',252,1);
ind = repmat([1:14]',18,1);
handles = plotSpread(data)
data = [];
for sub = 1:numel(subs)
load(['/Users/dianaperez/Desktop/Research/Segregation_Analyses/' subs{sub}↙
'_seg_index_net_withNaNnegs.mat'])
```

```
sub_struct.seg_ind(15,:) = [];
if contains(subs{sub}, 'INET')
sub_struct.seg_ind(:,5) = -1
end
data = [data sub_struct.seg_ind];
end
handles = plotSpread(data)
handles = plotSpread(data')
cx_ind(1:50) = 1;
cx_ind(51:90) = 2;
data = data';
cx_ind2 = repmat(cx_ind, 18,1);
cx_ind2 = repmat(cx_in4, 18,1);
cx_ind2 = repmat(cx_ind, 14,1);
atlas_dir = '/Volumes/fsmresfiles/PBS/Gratton_Lab/Atlases/';
atlas = 'Seitzman300';
atlas_params = atlas_parameters_GrattonLab(atlas,atlas_dir);% load atlas that contains↙
roi info (including which rois belong to each network)
nets = {'unassigned' 'SMd'  'SMl' 'CO' 'Aud' 'DMN'  'PMN' 'Vis' 'FP' 'Sal' 'Lang' 'DAN'↙
'MTL' 'PON'};
handles = plotSpread(data, 'categoryIdx', cx_ind,'categoryMarkers', {'o','o'},'xNames',↙
nets, 'categoryColors', {'b', 'r'},'binWidth', 1)
handles = plotSpread(data, 'categoryIdx', cx_ind','categoryMarkers', {'o','o'},'xNames',↙
nets, 'categoryColors', {'b', 'r'},'binWidth', 1)
data = [];
nets = {'unassigned' 'SMd'  'SMl' 'CO' 'Aud' 'DMN'  'PMN' 'Vis' 'FP' 'Sal' 'Lang' 'DAN'↙
'MTL' 'PON'};
for sub = 1:numel(subs)
load(['/Users/dianaperez/Desktop/Research/Segregation_Analyses/' subs{sub}↙
'_seg_index_net_withNaNnegs.mat'])
sub_struct.seg_ind(15,:) = [];
if contains(subs{sub}, 'INET')
sub_struct.seg_ind(:,5) = -1
end
data = [data sub_struct.seg_ind];
end
data = data';
cx_ind(1:50) = 1;
cx_ind(51:90) = 2;
cx_ind = repmat(cx_ind, 14,1);
%ind = repmat([1:14]',18,1);
handles = plotSpread(data, 'categoryIdx', cx_ind','categoryMarkers', {'o','o'},'xNames',↙
nets, 'categoryColors', {'b', 'r'},'binWidth', 1)
handles = plotSpread(data, 'categoryIdx', cx_ind','categoryMarkers', {'.','.'},'xNames',↙
nets, 'categoryColors', {'b', 'r'},'binWidth', 1)
close gcf
data = [];
nets = {'unassigned' 'SMd'  'SMl' 'CO' 'Aud' 'DMN'  'PMN' 'Vis' 'FP' 'Sal' 'Lang' 'DAN'↙
'MTL' 'PON'};
for sub = 1:numel(subs)
load(['/Users/dianaperez/Desktop/Research/Segregation_Analyses/' subs{sub}↙
'_seg_index_net_withNaNnegs.mat'])
sub_struct.seg_ind(15,:) = [];
if contains(subs{sub}, 'INET')
sub_struct.seg_ind(:,5) = -1
end
data = [data sub_struct.seg_ind];
end
data = data';
cx_ind(1:50) = 1;
```

```
cx_ind(51:90) = 2;
cx_ind = repmat(cx_ind, 14,1);
%ind = repmat([1:14]',18,1);
handles = plotSpread(data, 'categoryIdx', cx_ind','categoryMarkers', {'x','x'},'xNames',↙
nets, 'categoryColors', {'b', 'r'},'binWidth', 1)
hold on
% 0
data = [];
for sub = 1:numel(subs)
load(['/Users/dianaperez/Desktop/Research/Segregation_Analyses/' subs{sub}↙
'_seg_index_net_with0negs.mat'])
sub_struct.seg_ind(15,:) = [];
if contains(subs{sub}, 'INET')
sub_struct.seg_ind(:,5) = -1
end
data = [data sub_struct.seg_ind];
end
data = data';
handles = plotSpread(data, 'categoryIdx', cx_ind','categoryMarkers', {'.','.'},'xNames',↙
nets, 'categoryColors', {'b', 'r'},'binWidth', 1)
clear cx_ind
data = [];
nets = {'unassigned' 'SMd'  'SMl' 'CO' 'Aud' 'DMN'  'PMN' 'Vis' 'FP' 'Sal' 'Lang' 'DAN'↙
'MTL' 'PON'};
for sub = 1:numel(subs)
load(['/Users/dianaperez/Desktop/Research/Segregation_Analyses/' subs{sub}↙
'_seg_index_net_withNaNnegs.mat'])
sub_struct.seg_ind(15,:) = [];
if contains(subs{sub}, 'INET')
sub_struct.seg_ind(:,5) = -1
end
data = [data sub_struct.seg_ind];
end
data = data';
cx_ind(1:50) = 1;
cx_ind(51:90) = 2;
cx_ind = repmat(cx_ind, 14,1);
%ind = repmat([1:14]',18,1);
handles = plotSpread(data, 'categoryIdx', cx_ind','categoryMarkers', {'x','x'},'xNames',↙
nets, 'categoryColors', {'b', 'r'},'binWidth', 1)
hold on
% 0
data = [];
for sub = 1:numel(subs)
load(['/Users/dianaperez/Desktop/Research/Segregation_Analyses/' subs{sub}↙
'_seg_index_net_with0negs.mat'])
sub_struct.seg_ind(15,:) = [];
if contains(subs{sub}, 'INET')
sub_struct.seg_ind(:,5) = -1
end
data = [data sub_struct.seg_ind];
end
data = data';
handles = plotSpread(data, 'categoryIdx', cx_ind','categoryMarkers', {'.','.'},'xNames',↙
nets, 'categoryColors', {'b', 'r'},'binWidth', 1)
ax = gca;
ax.FontSize = 24;
axis([0.5, 15.5, .4, .9])
axis([0.5, 15.5, .3, .9])
axis([0.5, 15.5, .2, .9])
```

```
axis([0.5, 15.5, 0, .9])
axis([0.5, 15, 0, .9])
axis([0, 15, 0, .9])
axis([0, 15, -0.2, .9])
axis([0, 15, -0.3, .9])
data = [];
nets = {'unassign' 'SMd'    'SMl' 'CO' 'Aud' 'DMN'  'PMN' 'Vis' 'FP' 'Sal' 'Lang' 'DAN'↙
'MTL' 'PON'};
for sub = 1:numel(subs)
load(['/Users/dianaperez/Desktop/Research/Segregation_Analyses/' subs{sub}↙
'_seg_index_net_withNaNnegs.mat'])
sub_struct.seg_ind(15,:) = [];
if contains(subs{sub}, 'INET')
sub_struct.seg_ind(:,5) = -1
end
data = [data sub_struct.seg_ind];
end
data = data';
cx_ind(1:50) = 1;
cx_ind(51:90) = 2;
cx_ind = repmat(cx_ind, 14,1);
%ind = repmat([1:14]',18,1);
handles = plotSpread(data, 'categoryIdx', cx_ind','categoryMarkers', {'x','x'},'xNames',↙
nets, 'categoryColors', {'b', 'r'},'binWidth', 1)
hold on
% 0
data = [];
for sub = 1:numel(subs)
load(['/Users/dianaperez/Desktop/Research/Segregation_Analyses/' subs{sub}↙
'_seg_index_net_with0negs.mat'])
sub_struct.seg_ind(15,:) = [];
if contains(subs{sub}, 'INET')
sub_struct.seg_ind(:,5) = -1
end
data = [data sub_struct.seg_ind];
end
data = data';
handles = plotSpread(data, 'categoryIdx', cx_ind','categoryMarkers', {'.','.'},'xNames',↙
nets, 'categoryColors', {'b', 'r'},'binWidth', 1)
ax = gca;
ax.FontSize = 24;
axis([0.5, 15.5, .4, .9])
data = [];
nets = {'unassign' 'SMd'    'SMl' 'CO' 'Aud' 'DMN'  'PMN' 'Vis' 'FP' 'Sal' 'Lang' 'DAN'↙
'MTL' 'PON'};
for sub = 1:numel(subs)
load(['/Users/dianaperez/Desktop/Research/Segregation_Analyses/' subs{sub}↙
'_seg_index_net_withNaNnegs.mat'])
sub_struct.seg_ind(15,:) = [];
if contains(subs{sub}, 'INET')
sub_struct.seg_ind(:,5) = -1
end
data = [data sub_struct.seg_ind];
end
data = data';
cx_ind = [];
cx_ind(1:50) = 1;
cx_ind(51:90) = 2;
cx_ind = repmat(cx_ind, 14,1);
%ind = repmat([1:14]',18,1);
```

```
handles = plotSpread(data, 'categoryIdx', cx_ind','categoryMarkers', {'x','x'},'xNames',↙
nets, 'categoryColors', {'b', 'r'},'binWidth', 1)
hold on
% 0
data = [];
for sub = 1:numel(subs)
load(['/Users/dianaperez/Desktop/Research/Segregation_Analyses/' subs{sub}↙
'_seg_index_net_with0negs.mat'])
sub_struct.seg_ind(15,:) = [];
if contains(subs{sub}, 'INET')
sub_struct.seg_ind(:,5) = -1
end
data = [data sub_struct.seg_ind];
end
data = data';
handles = plotSpread(data, 'categoryIdx', cx_ind','categoryMarkers', {'.','.'},'xNames',↙
nets, 'categoryColors', {'b', 'r'},'binWidth', 1)
ax = gca;
ax.FontSize = 24;
axis([0, 15, -0.3, .9])
print(gcf, '/Users/dianaperez/Desktop/SI_by_net_allsess_NanVs0.jpg', '-dpng', '-r300')
print(gcf, '/Users/dianaperez/Desktop/SI_by_net_allsess_NanVs0.jpg', '-dpng', '-r300')
help mean
data = [];
avg = [];
nets = {'unassign' 'SMd'    'SMl' 'CO' 'Aud' 'DMN'  'PMN' 'Vis' 'FP' 'Sal' 'Lang' 'DAN'↙
'MTL' 'PON'};
for sub = 1:numel(subs)
load(['/Users/dianaperez/Desktop/Research/Segregation_Analyses/' subs{sub}↙
'_seg_index_net_withNaNnegs.mat'])
sub_struct.seg_ind(15,:) = [];
if contains(subs{sub}, 'INET')
sub_struct.seg_ind(:,5) = -1
end
avg = [avg; mean(sub_struct.seg_ind, 1)];
data = [data sub_struct.seg_ind];
end
data = [];
avg = [];
nets = {'unassign' 'SMd'    'SMl' 'CO' 'Aud' 'DMN'  'PMN' 'Vis' 'FP' 'Sal' 'Lang' 'DAN'↙
'MTL' 'PON'};
for sub = 1:numel(subs)
load(['/Users/dianaperez/Desktop/Research/Segregation_Analyses/' subs{sub}↙
'_seg_index_net_withNaNnegs.mat'])
sub_struct.seg_ind(15,:) = [];
avg = [avg; mean(sub_struct.seg_ind, 1)];
if contains(subs{sub}, 'INET')
sub_struct.seg_ind(:,5) = -1
end
data = [data sub_struct.seg_ind];
end
mean(sub_struct.seg_ind, 1)
avg = [avg; mean(sub_struct.seg_ind, 2)];
mean(sub_struct.seg_ind, 2)
data = [];
avg = [];
nets = {'unassign' 'SMd'    'SMl' 'CO' 'Aud' 'DMN'  'PMN' 'Vis' 'FP' 'Sal' 'Lang' 'DAN'↙
'MTL' 'PON'};
for sub = 1:numel(subs)
load(['/Users/dianaperez/Desktop/Research/Segregation_Analyses/' subs{sub}↙
```

```
'_seg_index_net_withNaNnegs.mat'])
sub_struct.seg_ind(15,:) = [];
avg = [avg mean(sub_struct.seg_ind, 2)];
if contains(subs{sub}, 'INET')
sub_struct.seg_ind(:,5) = -1
end
data = [data sub_struct.seg_ind];
end
data = data';
cx_ind = [1,1,1,1,1,1,1,1,1,1,2,2,2,2,2,2,2,2]';
cx_ind = repmat(cx_ind, 14,1);
cx_ind = repmat(cx_ind, 1,14);
cx_ind = [1,1,1,1,1,1,1,1,1,1,2,2,2,2,2,2,2,2]';
cx_ind = repmat(cx_ind, 1,14);
cx_ind = [1,1,1,1,1,1,1,1,1,1,2,2,2,2,2,2,2,2];
cx_ind = repmat(cx_ind, 1,14);
cx_ind = [1,1,1,1,1,1,1,1,1,1,2,2,2,2,2,2,2,2];
cx_ind = repmat(cx_ind, 14,1);
data = [];
avg = [];
nets = {'unassign' 'SMd'    'SMl' 'CO' 'Aud' 'DMN'  'PMN' 'Vis' 'FP' 'Sal' 'Lang' 'DAN'↙
'MTL' 'PON'};
for sub = 1:numel(subs)
load(['/Users/dianaperez/Desktop/Research/Segregation_Analyses/' subs{sub}↙
'_seg_index_net_withNaNnegs.mat'])
sub_struct.seg_ind(15,:) = [];
avg = [avg mean(sub_struct.seg_ind, 2)];
if contains(subs{sub}, 'INET')
sub_struct.seg_ind(:,5) = -1
end
data = [data sub_struct.seg_ind];
end
data = data';
avg_nan = avg';
cx_ind = [];
cx_ind(1:50) = 1;
cx_ind(51:90) = 2;
cx_ind = repmat(cx_ind, 14,1);
%ind = repmat([1:14]',18,1);
handles = plotSpread(data, 'categoryIdx', cx_ind','categoryMarkers', {'x','x'},'xNames',↙
nets, 'categoryColors', {'b', 'r'},'binWidth', 1)
hold on
% 0
data = [];
avg = [];
for sub = 1:numel(subs)
load(['/Users/dianaperez/Desktop/Research/Segregation_Analyses/' subs{sub}↙
'_seg_index_net_with0negs.mat'])
sub_struct.seg_ind(15,:) = [];
avg = [avg mean(sub_struct.seg_ind, 2)];
if contains(subs{sub}, 'INET')
sub_struct.seg_ind(:,5) = -1
end
data = [data sub_struct.seg_ind];
end
avg_zero = avg';
data = data';
handles = plotSpread(data, 'categoryIdx', cx_ind','categoryMarkers', {'.','.'},'xNames',↙
nets, 'categoryColors', {'b', 'r'},'binWidth', 1)
ax = gca;
```

```
ax.FontSize = 24;
axis([0, 15, -0.3, .9])
%print(gcf, '/Users/dianaperez/Desktop/SI_by_net_allsess_NanVs0.jpg', '-dpng', '-r300')
close gcf
cx_ind = [1,1,1,1,1,1,1,1,1,1,2,2,2,2,2,2,2,2];
cx_ind = repmat(cx_ind, 14,1);
handles = plotSpread(avg_nan, 'categoryIdx', cx_ind,'categoryMarkers',↙
{'x','x'},'xNames', nets, 'categoryColors', {'b', 'r'},'binWidth', 1)
hold on
handles = plotSpread(avg_zero, 'categoryIdx', cx_ind,'categoryMarkers',↙
{'.','.'},'xNames', nets, 'categoryColors', {'b', 'r'},'binWidth', 1)
cx_ind = [1,1,1,1,1,1,1,1,1,1,2,2,2,2,2,2,2,2];
cx_ind = [1,1,1,1,1,1,1,1,1,1,2,2,2,2,2,2,2,2]';
cx_ind = repmat(cx_ind, 14,1);
cx_ind = [1,1,1,1,1,1,1,1,1,1,2,2,2,2,2,2,2,2]';
cx_ind = repmat(cx_ind, 1,14);
close gcf
cx_ind = [1,1,1,1,1,1,1,1,1,1,2,2,2,2,2,2,2,2]';
cx_ind = repmat(cx_ind, 1,14);
handles = plotSpread(avg_nan, 'categoryIdx', cx_ind,'categoryMarkers',↙
{'x','x'},'xNames', nets, 'categoryColors', {'b', 'r'},'binWidth', 1)
hold on
handles = plotSpread(avg_zero, 'categoryIdx', cx_ind,'categoryMarkers',↙
{'.','.'},'xNames', nets, 'categoryColors', {'b', 'r'},'binWidth', 1)
cx_ind = [1,1,1,1,1,1,1,1,1,1,2,2,2,2,2,2,2,2]';
cx_ind = repmat(cx_ind, 1,14);
handles = plotSpread(avg_nan, 'categoryIdx', cx_ind,'categoryMarkers',↙
{'x','x'},'xNames', nets, 'categoryColors', {'b', 'r'},'binWidth', 1)
hold on
handles = plotSpread(avg_zero, 'categoryIdx', cx_ind,'categoryMarkers',↙
{'o','o'},'xNames', nets, 'categoryColors', {'b', 'r'},'binWidth', 1)
ax = gca;
ax.FontSize = 24;
axis([0, 15, -0.3, .9])
axis([0, 15, -0.1, .9])
print(gcf, '/Users/dianaperez/Desktop/SI_by_net_NanVs0.jpg', '-dpng', '-r300')
var_freq_size_net
perms_var_freq_size
load↙
('/Users/dianaperez/Desktop/Research/Lateralization/lateralization_code/testing_output/HC↙
P384_variants_info.mat')
clear all
load↙
('/Users/dianaperez/Desktop/Research/Lateralization/lateralization_code/testing_output/HC↙
P384_variants_info.mat')
lh_numvars = variants_info.left_hem.group_avg(:,3);
rh_numvars = variants_info.right_hem.group_avg(:,3);
scatter(lh_numvars, rh_numvars, 80, rgb_colors, 'filled')
hold on
scatter(lh_numvars, rh_numvars, 80, 'k')
axis([0 2.5 0 2.5])
line = refline(1,0);
line.Color = 'black';
xlabel('Left Hemisphere')
ax = gca;
ax.FontSize = 24;
for net = 1:16
se_lh(net) = std(networksxHem.clustersLH(:,net))/sqrt(384);
se_rh(net) = std(networksxHem.clustersRH(:,net))/sqrt(384);
end
```

```
h = errorbar(lh_numvars, rh_numvars, se_rh, se_rh, se_lh, se_lh, 'o')
h.Color = [0,0,0];
rgb_colors = [1 0 0; %DMN
0 0 .6; %Vis
1 1 0; %FP
.67 .67 .67; %Unassigned
0 .8 0; %DAN
.67 .67 .67; %Unassigned2
0 .6 .6;%VAN
0 0 0; % Sal
.3 0 .6; %CON
.2 1 1; %SMd
1 .5 0; % SMl
.6 .2 1; %Aud
.2 1 .2; %Tpole
0 .2 .4; %MTL
0 0 1; %PMN
.8 .8 .6]; %PON
scatter(lh_numvars, rh_numvars, 80, rgb_colors, 'filled')
hold on
scatter(lh_numvars, rh_numvars, 80, 'k')
axis([0 2.5 0 2.5])
line = refline(1,0);
line.Color = 'black';
xlabel('Left Hemisphere')
ax = gca;
ax.FontSize = 24;
for net = 1:16
se_lh(net) = std(networksxHem.clustersLH(:,net))/sqrt(384);
se_rh(net) = std(networksxHem.clustersRH(:,net))/sqrt(384);
end
h = errorbar(lh_numvars, rh_numvars, se_rh, se_rh, se_lh, se_lh, 'o')
h.Color = [0,0,0];
avgVarSize = variants_info.left_hem.group_avg{:,3};
lh_numvars = variants_info.left_hem.group_avg{:,3};
rh_numvars = variants_info.right_hem.group_avg{:,3};
scatter(lh_numvars, rh_numvars, 80, rgb_colors, 'filled')
hold on
scatter(lh_numvars, rh_numvars, 80, 'k')
axis([0 2.5 0 2.5])
line = refline(1,0);
line.Color = 'black';
xlabel('Left Hemisphere')
ax = gca;
ax.FontSize = 24;
for net = 1:16
se_lh(net) = std(networksxHem.clustersLH(:,net))/sqrt(384);
se_rh(net) = std(networksxHem.clustersRH(:,net))/sqrt(384);
end
h = errorbar(lh_numvars, rh_numvars, se_rh, se_rh, se_lh, se_lh, 'o')
h.Color = [0,0,0];
load↙
('/Users/dianaperez/Desktop/Research/Lateralization/lateralization_code/testing_output/HC↙
P384_networksxHem.mat')
var_freq_size_net
[data_location num2str(subs{g,1}(n))
netAssign_str]
[data_location num2str(subs{g,1}(n)) netAssign_str]
var_freq_size_net
load↙
```

```
('/Users/dianaperez/Desktop/Research/Lateralization/lateralization_code/testing_output/HC↙
P384_networksxHem.mat')
clear all
load↙
('/Users/dianaperez/Desktop/Research/Lateralization/lateralization_code/testing_output/HC↙
P384_networksxHem.mat')
lh_numvars = [];
rh_numvars = [];
for net = 1:16
vars_LH = []; vars_RH = [];
vars_LH = networksxHem.avgSizeLH{find(networksxHem.avgSizeLH{:,net}>0), net};
lh_numvars(net) = mean(vars_LH);
vars_RH = networksxHem.avgSizeRH{find(networksxHem.avgSizeRH{:,net}>0), net};
rh_numvars(net) = mean(vars_RH);
end
lh_numvars = [];
rh_numvars = [];
for net = 1:16
vars_LH = []; vars_RH = [];
vars_LH = networksxHem.avgSizeLH(find(networksxHem.avgSizeLH(:,net)>0), net);
lh_numvars(net) = mean(vars_LH);
vars_RH = networksxHem.avgSizeRH(find(networksxHem.avgSizeRH(:,net)>0), net);
rh_numvars(net) = mean(vars_RH);
end
lh_numvars = [];
rh_numvars = [];
for net = 1:16
vars_LH = []; vars_RH = [];
vars_LH = networksxHem.avgSizeLH(find(networksxHem.avgSizeLH(:,net)>0), net);
if length(vars_LH)>0
lh_numvars(net) = mean(vars_LH);
else
lh_numvars(net) = 0;
end
vars_RH = networksxHem.avgSizeRH(find(networksxHem.avgSizeRH(:,net)>0), net);
if length(vars_RH)>0
rh_numvars(net) = mean(vars_RH);
else
rh_numvars(net) = 0;
end
end
scatter(lh_numvars, rh_numvars, 80, rgb_colors, 'filled')
hold on
scatter(lh_numvars, rh_numvars, 80, 'k')
rgb_colors = [1 0 0; %DMN
0 0 .6; %Vis
1 1 0; %FP
.67 .67 .67; %Unassigned
0 .8 0; %DAN
.67 .67 .67; %Unassigned2
0 .6 .6;%VAN
0 0 0; % Sal
.3 0 .6; %CON
.2 1 1; %SMd
1 .5 0; % SMl
.6 .2 1; %Aud
.2 1 .2; %Tpole
0 .2 .4; %MTL
0 0 1; %PMN
.8 .8 .6]; %PON
```

```
scatter(lh_numvars, rh_numvars, 80, rgb_colors, 'filled')
hold on
scatter(lh_numvars, rh_numvars, 80, 'k')
axis([0 2.5 0 2.5])
line = refline(1,0);
line.Color = 'black';
xlabel('Left Hemisphere')
ax = gca;
ax.FontSize = 24;
scatter(lh_numvars, rh_numvars, 80, rgb_colors, 'filled')
hold on
scatter(lh_numvars, rh_numvars, 80, 'k')
axis([150 700 150 700])
line = refline(1,0);
line.Color = 'black';
xlabel('Left Hemisphere')
ax = gca;
ax.FontSize = 24;
ylabel('Right Hemisphere')
for net = 1:16
se_lh(net) = std(networksxHem.clustersLH(:,net))/sqrt(384);
se_rh(net) = std(networksxHem.clustersRH(:,net))/sqrt(384);
end
h = errorbar(lh_numvars, rh_numvars, se_rh, se_rh, se_lh, se_lh, 'o')
h.Color = [0,0,0];
h = errorbar(lh_numvars, rh_numvars, se_rh, se_rh, se_lh, se_lh, 'o', 'MarkerSize', 80)
h = errorbar(lh_numvars, rh_numvars, se_rh, se_rh, se_lh, se_lh, 'o', 'MarkerSize', 50)
h = errorbar(lh_numvars, rh_numvars, se_rh, se_rh, se_lh, se_lh, 'MarkerSize', 50)
h = errorbar(lh_numvars, rh_numvars, se_rh, se_rh, se_lh, se_lh, 'o', 'MarkerSize', 20)
h = errorbar(lh_numvars, rh_numvars, se_rh, se_rh, se_lh, se_lh, 'o', 'MarkerSize', 10)
scatter(lh_numvars, rh_numvars, 80, rgb_colors, 'filled')
hold on
scatter(lh_numvars, rh_numvars, 80, 'k')
axis([150 700 150 700])
line = refline(1,0);
line.Color = 'black';
xlabel('Left Hemisphere')
ylabel('Right Hemisphere')
ax = gca;
ax.FontSize = 24;
h = errorbar(lh_numvars, rh_numvars, se_rh, se_rh, se_lh, se_lh, 'o', 'MarkerSize', 10)
h = errorbar(lh_numvars, rh_numvars, se_rh, se_rh, se_lh, se_lh, 'o', 'MarkerSize', 15)
scatter(lh_numvars, rh_numvars, 80, rgb_colors, 'filled')
hold on
scatter(lh_numvars, rh_numvars, 80, 'k')
%axis([0 2.5 0 2.5])
axis([150 700 150 700])
line = refline(1,0);
line.Color = 'black';
xlabel('Left Hemisphere')
ylabel('Right Hemisphere')
ax = gca;
ax.FontSize = 24;
vars_RH = networksxHem.avgSizeRH(find(networksxHem.avgSizeRH(:,14)>0), 14);
h = errorbar(lh_numvars, rh_numvars, se_rh, se_rh, se_lh, se_lh, 'o', 'MarkerSize', 10)
h.Color = [0,0,0];
print(gcf,↙
'/Users/dianaperez/Desktop/Research/Lateralization/lateralization_code/HCP384_varsize_sca↙
tterplot.jpg', '-dpng', '-r300')
help median
```

```
lh_numvars = [];
rh_numvars = [];
for net = 1:16
vars_LH = []; vars_RH = [];
vars_LH = networksxHem.avgSizeLH(find(networksxHem.avgSizeLH(:,net)>0), net);
if length(vars_LH)>0
lh_numvars(net) = median(vars_LH);
else
lh_numvars(net) = 0;
end
vars_RH = networksxHem.avgSizeRH(find(networksxHem.avgSizeRH(:,net)>0), net);
if length(vars_RH)>0
rh_numvars(net) = median(vars_RH);
else
rh_numvars(net) = 0;
end
end
scatter(lh_numvars, rh_numvars, 80, rgb_colors, 'filled')
hold on
scatter(lh_numvars, rh_numvars, 80, 'k')
%axis([0 2.5 0 2.5])
axis([150 700 150 700])
line = refline(1,0);
line.Color = 'black';
xlabel('Left Hemisphere')
ylabel('Right Hemisphere')
ax = gca;
ax.FontSize = 24;
for net = 1:16
se_lh(net) = std(networksxHem.clustersLH(:,net))/sqrt(384);
se_rh(net) = std(networksxHem.clustersRH(:,net))/sqrt(384);
end
h = errorbar(lh_numvars, rh_numvars, se_rh, se_rh, se_lh, se_lh, 'o', 'MarkerSize', 10)
h.Color = [0,0,0];
rgb_colors = [1 0 0; %DMN
0 0 .6; %Vis
1 1 0; %FP
.67 .67 .67; %Unassigned
0 .8 0; %DAN
.67 .67 .67; %Unassigned2
0 .6 .6;%VAN
0 0 0; % Sal
.3 0 .6; %CON
.2 1 1; %SMd
1 .5 0; % SMl
.6 .2 1; %Aud
0 .2 .4; %Tpole
.2 1 .2; %MTL
0 0 1; %PMN
.8 .8 .6]; %PON
lh_numvars = [];
rh_numvars = [];
for net = 1:16
vars_LH = []; vars_RH = [];
vars_LH = networksxHem.avgSizeLH(find(networksxHem.avgSizeLH(:,net)>0), net);
if length(vars_LH)>0
lh_numvars(net) = median(vars_LH);
else
lh_numvars(net) = 0;
end
```

```
vars_RH = networksxHem.avgSizeRH(find(networksxHem.avgSizeRH(:,net)>0), net);
if length(vars_RH)>0
rh_numvars(net) = median(vars_RH);
else
rh_numvars(net) = 0;
end
end
scatter(lh_numvars, rh_numvars, 80, rgb_colors, 'filled')
hold on
scatter(lh_numvars, rh_numvars, 80, 'k')
%axis([0 2.5 0 2.5])
axis([150 700 150 700])
line = refline(1,0);
line.Color = 'black';
xlabel('Left Hemisphere')
ylabel('Right Hemisphere')
ax = gca;
ax.FontSize = 24;
for net = 1:16
se_lh(net) = std(networksxHem.clustersLH(:,net))/sqrt(384);
se_rh(net) = std(networksxHem.clustersRH(:,net))/sqrt(384);
end
h = errorbar(lh_numvars, rh_numvars, se_rh, se_rh, se_lh, se_lh, 'o', 'MarkerSize', 10)
h.Color = [0,0,0];
clear all
load↙
('/Users/dianaperez/Desktop/Research/Lateralization/lateralization_code/testing_output/HC↙
P384_networksxHem.mat')
lh_numvars = [];
rh_numvars = [];
for net = 1:16
vars_LH = []; vars_RH = [];
vars_LH = networksxHem.avgSizeLH(find(networksxHem.avgSizeLH(:,net)>0), net);
if length(vars_LH)>0
lh_numvars(net) = median(vars_LH);
else
lh_numvars(net) = 0;
end
vars_RH = networksxHem.avgSizeRH(find(networksxHem.avgSizeRH(:,net)>0), net);
if length(vars_RH)>0
rh_numvars(net) = median(vars_RH);
else
rh_numvars(net) = 0;
end
end
scatter(lh_numvars, rh_numvars, 80, rgb_colors, 'filled')
hold on
scatter(lh_numvars, rh_numvars, 80, 'k')
%axis([0 2.5 0 2.5])
axis([150 700 150 700])
line = refline(1,0);
line.Color = 'black';
xlabel('Left Hemisphere')
ylabel('Right Hemisphere')
ax = gca;
ax.FontSize = 24;
for net = 1:16
se_lh(net) = std(networksxHem.clustersLH(:,net))/sqrt(384);
se_rh(net) = std(networksxHem.clustersRH(:,net))/sqrt(384);
end
```

```
h = errorbar(lh_numvars, rh_numvars, se_rh, se_rh, se_lh, se_lh, 'o', 'MarkerSize', 10)
h.Color = [0,0,0];
rgb_colors = [1 0 0; %DMN
0 0 .6; %Vis
1 1 0; %FP
.67 .67 .67; %Unassigned
0 .8 0; %DAN
.67 .67 .67; %Unassigned2
0 .6 .6;%VAN
0 0 0; % Sal
.3 0 .6; %CON
.2 1 1; %SMd
1 .5 0; % SMl
.6 .2 1; %Aud
0 .2 .4; %Tpole
.2 1 .2; %MTL
0 0 1; %PMN
.8 .8 .6]; %PON
lh_numvars = [];
rh_numvars = [];
for net = 1:16
vars_LH = []; vars_RH = [];
vars_LH = networksxHem.avgSizeLH(find(networksxHem.avgSizeLH(:,net)>0), net);
if length(vars_LH)>0
lh_numvars(net) = median(vars_LH);
else
lh_numvars(net) = 0;
end
vars_RH = networksxHem.avgSizeRH(find(networksxHem.avgSizeRH(:,net)>0), net);
if length(vars_RH)>0
rh_numvars(net) = median(vars_RH);
else
rh_numvars(net) = 0;
end
end
scatter(lh_numvars, rh_numvars, 80, rgb_colors, 'filled')
hold on
scatter(lh_numvars, rh_numvars, 80, 'k')
%axis([0 2.5 0 2.5])
axis([150 700 150 700])
line = refline(1,0);
line.Color = 'black';
xlabel('Left Hemisphere')
ylabel('Right Hemisphere')
ax = gca;
ax.FontSize = 24;
for net = 1:16
se_lh(net) = std(networksxHem.clustersLH(:,net))/sqrt(384);
se_rh(net) = std(networksxHem.clustersRH(:,net))/sqrt(384);
end
h = errorbar(lh_numvars, rh_numvars, se_rh, se_rh, se_lh, se_lh, 'o', 'MarkerSize', 10)
h.Color = [0,0,0];
scatter(lh_numvars, rh_numvars, 80, rgb_colors, 'filled')
hold on
scatter(lh_numvars, rh_numvars, 80, 'k')
for net = 1:16
se_lh(net) = std(networksxHem.avgSizeLH(:,net))/sqrt(384);
se_rh(net) = std(networksxHem.avgSizeRH(:,net))/sqrt(384);
end
h = errorbar(lh_numvars, rh_numvars, se_rh, se_rh, se_lh, se_lh, 'o', 'MarkerSize', 10)
```

```
h.Color = [0,0,0];
scatter(lh_numvars, rh_numvars, 80, rgb_colors, 'filled')
hold on
scatter(lh_numvars, rh_numvars, 80, 'k')
print(gcf,↙
'/Users/dianaperez/Desktop/Research/Lateralization/lateralization_code/HCP384_varsize_sca↙
tterplot.jpg', '-dpng', '-r300')
workbenchdir = '/Applications/workbench/bin_macosx64/';
varmap_path = '/Users/dianaperez/Desktop/MSC_variants/MSC01_variants_reassigned.dtseries.↙
nii'
boder_labels = '/Users/dianaperez/Downloads/wbBorderLabelFile.txt';
output_path = '/Users/dianaperez/Desktop/MSC_variants/MSC01_variant_borders.dlabel.nii';
system([workbenchdir 'wb_command -cifti-label-import ' varmap_path border_labels↙
output_path])
system([workbenchdir 'wb_command -cifti-label-import ' varmap_path boder_labels↙
output_path])
system([workbenchdir 'wb_command -cifti-label-import ' varmap_path ' ' border_labels ' '↙
output_path])
system([workbenchdir 'wb_command -cifti-label-import ' varmap_path ' ' boder_labels ' '↙
output_path])
output_path_left = '/Users/dianaperez/Desktop/MSC_variants/MSC01_variant_borders_left.↙
dlabel.gii';
output_path_right = '/Users/dianaperez/Desktop/MSC_variants/MSC01_variant_borders_right.↙
dlabel.gii';
system([workbenchdir 'wb_command -cifti-separate ' output_path ' COLUMN -label↙
CORTEX_LEFT ' output_path_left ' -label CORTEX_RIGHT ' output_path_right])
output_path_left = '/Users/dianaperez/Desktop/MSC_variants/MSC01_variant_borders_left.↙
label.gii';
output_path_right = '/Users/dianaperez/Desktop/MSC_variants/MSC01_variant_borders_right.↙
label.gii';
system([workbenchdir 'wb_command -cifti-separate ' output_path ' COLUMN -label↙
CORTEX_LEFT ' output_path_left ' -label CORTEX_RIGHT ' output_path_right])
midthick_path =↙
'/Users/dianaperez/Desktop/Organization/CNS_analyses/Dependencies/32k_ConteAtlas_v2_distr↙
ibute/Conte69_atlas-v2.LR.32k_fs_LR.wb/Conte69.L.midthickness.32k_fs_LR.surf.gii';
output_border_L = '/Users/dianaperez/Desktop/MSC_variants/MSC01_variants_L.border';
system([workbenchdir 'wb_command -label-to-border ' midthick_path ' '  output_path_left '↙
' output_border_L])
midthick_path =↙
'/Users/dianaperez/Desktop/Organization/CNS_analyses/Dependencies/32k_ConteAtlas_v2_distr↙
ibute/Conte69_atlas-v2.LR.32k_fs_LR.wb/Conte69.R.midthickness.32k_fs_LR.surf.gii';
output_border_R = '/Users/dianaperez/Desktop/MSC_variants/MSC01_variants_R.border';
system([workbenchdir 'wb_command -label-to-border ' midthick_path ' '  output_path_right↙
' ' output_border_R])
midthick_path =↙
'/Users/dianaperez/Desktop/Organization/CNS_analyses/Dependencies/32k_ConteAtlas_v2_distr↙
ibute/Conte69.L.midthickness.32k_fs_LR.surf.gii';
output_border_L = '/Users/dianaperez/Desktop/MSC_variants/MSC01_variants_L.border';
system([workbenchdir 'wb_command -label-to-border ' midthick_path ' '  output_path_left '↙
' output_border_L])
midthick_path =↙
'/Users/dianaperez/Desktop/Organization/CNS_analyses/Dependencies/32k_ConteAtlas_v2_distr↙
ibute/Conte69.R.midthickness.32k_fs_LR.surf.gii';
output_border_R = '/Users/dianaperez/Desktop/MSC_variants/MSC01_variants_R.border';
system([workbenchdir 'wb_command -label-to-border ' midthick_path ' '  output_path_right↙
' ' output_border_R])
varmap_path = '/Users/dianaperez/Desktop/MSC_variants/MSC02_variants_reassigned.dtseries.↙
nii';
boder_labels = '/Users/dianaperez/Downloads/wbBorderLabelFile.txt';
output_path = '/Users/dianaperez/Desktop/MSC_variants/MSC02_variant_borders.dlabel.nii';
```

```
system([workbenchdir 'wb_command -cifti-label-import ' varmap_path ' ' border_labels ' '↙
output_path])
output_path_left = '/Users/dianaperez/Desktop/MSC_variants/MSC02_variant_borders_left.↙
label.gii';
output_path_right = '/Users/dianaperez/Desktop/MSC_variants/MSC02_variant_borders_right.↙
label.gii';
system([workbenchdir 'wb_command -cifti-separate ' output_path ' COLUMN -label↙
CORTEX_LEFT ' output_path_left ' -label CORTEX_RIGHT ' output_path_right])
midthick_path =↙
'/Users/dianaperez/Desktop/Organization/CNS_analyses/Dependencies/32k_ConteAtlas_v2_distr↙
ibute/Conte69.L.midthickness.32k_fs_LR.surf.gii';
output_border_L = '/Users/dianaperez/Desktop/MSC_variants/MSC02_variants_L.border';
system([workbenchdir 'wb_command -label-to-border ' midthick_path ' '  output_path_left '↙
' output_border_L])
midthick_path =↙
'/Users/dianaperez/Desktop/Organization/CNS_analyses/Dependencies/32k_ConteAtlas_v2_distr↙
ibute/Conte69.R.midthickness.32k_fs_LR.surf.gii';
output_border_R = '/Users/dianaperez/Desktop/MSC_variants/MSC02_variants_R.border';
system([workbenchdir 'wb_command -label-to-border ' midthick_path ' '  output_path_right↙
' ' output_border_R])
varmap_path = '/Users/dianaperez/Desktop/MSC_variants/MSC02_variants_reassigned.dtseries.↙
nii';
border_labels = '/Users/dianaperez/Downloads/wbBorderLabelFile.txt';
output_path = '/Users/dianaperez/Desktop/MSC_variants/MSC02_variant_borders.dlabel.nii';
system([workbenchdir 'wb_command -cifti-label-import ' varmap_path ' ' border_labels ' '↙
output_path])
output_path_left = '/Users/dianaperez/Desktop/MSC_variants/MSC02_variant_borders_left.↙
label.gii';
output_path_right = '/Users/dianaperez/Desktop/MSC_variants/MSC02_variant_borders_right.↙
label.gii';
system([workbenchdir 'wb_command -cifti-separate ' output_path ' COLUMN -label↙
CORTEX_LEFT ' output_path_left ' -label CORTEX_RIGHT ' output_path_right])
midthick_path =↙
'/Users/dianaperez/Desktop/Organization/CNS_analyses/Dependencies/32k_ConteAtlas_v2_distr↙
ibute/Conte69.L.midthickness.32k_fs_LR.surf.gii';
output_border_L = '/Users/dianaperez/Desktop/MSC_variants/MSC02_variants_L.border';
system([workbenchdir 'wb_command -label-to-border ' midthick_path ' '  output_path_left '↙
' output_border_L])
midthick_path =↙
'/Users/dianaperez/Desktop/Organization/CNS_analyses/Dependencies/32k_ConteAtlas_v2_distr↙
ibute/Conte69.R.midthickness.32k_fs_LR.surf.gii';
output_border_R = '/Users/dianaperez/Desktop/MSC_variants/MSC02_variants_R.border';
system([workbenchdir 'wb_command -label-to-border ' midthick_path ' '  output_path_right↙
' ' output_border_R])
clear all
load↙
('/Users/dianaperez/Desktop/Research/Lateralization/lateralization_code/testing_output/HC↙
P384_networksxHem.mat')
lh_numvars = [];
rh_numvars = [];
for net = 1:16
vars_LH = []; vars_RH = [];
vars_LH = networksxHem.avgSizeLH(find(networksxHem.surfaceSizeLH(:,net)>0), net);
if length(vars_LH)>0
lh_numvars(net) = median(vars_LH);
else
lh_numvars(net) = 0;
end
vars_RH = networksxHem.avgSizeRH(find(networksxHem.surfaceRH(:,net)>0), net);
if length(vars_RH)>0
```

```
rh_numvars(net) = median(vars_RH);
else
rh_numvars(net) = 0;
end
end
lh_numvars = [];
rh_numvars = [];
for net = 1:16
vars_LH = []; vars_RH = [];
vars_LH = networksxHem.avgSizeLH(find(networksxHem.surfaceLH(:,net)>0), net);
if length(vars_LH)>0
lh_numvars(net) = median(vars_LH);
else
lh_numvars(net) = 0;
end
vars_RH = networksxHem.avgSizeRH(find(networksxHem.surfaceRH(:,net)>0), net);
if length(vars_RH)>0
rh_numvars(net) = median(vars_RH);
else
rh_numvars(net) = 0;
end
end
scatter(lh_numvars, rh_numvars, 80, rgb_colors, 'filled')
hold on
scatter(lh_numvars, rh_numvars, 80, 'k')
rgb_colors = [1 0 0; %DMN
0 0 .6; %Vis
1 1 0; %FP
.67 .67 .67; %Unassigned
0 .8 0; %DAN
.67 .67 .67; %Unassigned2
0 .6 .6;%VAN
0 0 0; % Sal
.3 0 .6; %CON
.2 1 1; %SMd
1 .5 0; % SMl
.6 .2 1; %Aud
0 .2 .4; %Tpole
.2 1 .2; %MTL
0 0 1; %PMN
.8 .8 .6]; %PON
scatter(lh_numvars, rh_numvars, 80, rgb_colors, 'filled')
hold on
scatter(lh_numvars, rh_numvars, 80, 'k')
line = refline(1,0);
line.Color = 'black';
xlabel('Left Hemisphere')
ylabel('Right Hemisphere')
ax = gca;
ax.FontSize = 24;
for net = 1:16
se_lh(net) = std(networksxHem.surfaceLH(:,net))/sqrt(384);
se_rh(net) = std(networksxHem.surfaceRH(:,net))/sqrt(384);
end
h = errorbar(lh_numvars, rh_numvars, se_rh, se_rh, se_lh, se_lh, 'o', 'MarkerSize', 10)
h.Color = [0,0,0];
axis([150 700 150 700])
line = refline(1,0);
lh_numvars = [];
rh_numvars = [];
```

```
for net = 1:16
vars_LH = []; vars_RH = [];
vars_LH = networksxHem.surfaceLH(find(networksxHem.surfaceLH(:,net)>0), net);
if length(vars_LH)>0
lh_numvars(net) = median(vars_LH);
else
lh_numvars(net) = 0;
end
vars_RH = networksxHem.surfaceRH(find(networksxHem.surfaceRH(:,net)>0), net);
if length(vars_RH)>0
rh_numvars(net) = median(vars_RH);
else
rh_numvars(net) = 0;
end
end
scatter(lh_numvars, rh_numvars, 80, rgb_colors, 'filled')
hold on
scatter(lh_numvars, rh_numvars, 80, 'k')
lh_numvars = [];
rh_numvars = [];
for net = 1:16
vars_LH = []; vars_RH = [];
vars_LH = networksxHem.surfaceLH(find(networksxHem.surfaceLH(:,net)>0), net);
if length(vars_LH)>0
lh_numvars(net) = mean(vars_LH);
else
lh_numvars(net) = 0;
end
vars_RH = networksxHem.surfaceRH(find(networksxHem.surfaceRH(:,net)>0), net);
if length(vars_RH)>0
rh_numvars(net) = mean(vars_RH);
else
rh_numvars(net) = 0;
end
end
scatter(lh_numvars, rh_numvars, 80, rgb_colors, 'filled')
hold on
scatter(lh_numvars, rh_numvars, 80, 'k')
axis([200 700 200 700])
line = refline(1,0);
line.Color = 'black';
xlabel('Left Hemisphere')
ylabel('Right Hemisphere')
ax = gca;
ax.FontSize = 24;
for net = 1:16
se_lh(net) = std(networksxHem.surfaceLH(:,net))/sqrt(384);
se_rh(net) = std(networksxHem.surfaceRH(:,net))/sqrt(384);
end
h = errorbar(lh_numvars, rh_numvars, se_rh, se_rh, se_lh, se_lh, 'o', 'MarkerSize', 10)
h.Color = [0,0,0];
print(gcf,↙
'/Users/dianaperez/Desktop/Research/lateralization_code/HCP384_variant_territory_scatterp↙
lot.jpg', '-dpng', '-r300')
lh_numvars = [];
rh_numvars = [];
for net = 1:16
vars_LH = []; vars_RH = [];
vars_LH = networksxHem.surfaceLH(find(networksxHem.surfaceLH(:,net)>0), net);
if length(vars_LH)>0
```

```
lh_numvars(net) = mean(vars_LH);
else
lh_numvars(net) = 0;
end
vars_RH = networksxHem.surfaceRH(find(networksxHem.surfaceRH(:,net)>0), net);
if length(vars_RH)>0
rh_numvars(net) = mean(vars_RH);
else
rh_numvars(net) = 0;
end
end
scatter(lh_numvars, rh_numvars, 80, rgb_colors, 'filled')
hold on
scatter(lh_numvars, rh_numvars, 80, 'k')
%axis([0 2.5 0 2.5])
axis([200 700 200 700])
line = refline(1,0);
line.Color = 'black';
xlabel('Left Hemisphere')
ylabel('Right Hemisphere')
ax = gca;
ax.FontSize = 24;
for net = 1:16
se_lh(net) = std(networksxHem.surfaceLH(:,net))/sqrt(384);
se_rh(net) = std(networksxHem.surfaceRH(:,net))/sqrt(384);
end
h = errorbar(lh_numvars, rh_numvars, se_rh, se_rh, se_lh, se_lh, 'o', 'MarkerSize', 10)
h.Color = [0,0,0];
print(gcf,↙
'/Users/dianaperez/Desktop/Research/lateralization_code/HCP384_variant_territory_scatterp↙
lot.jpg', '-dpng', '-r300')
%-- 6/20/22, 7:38 AM --%
rgb_colors = [1 0 0; %DMN
0 0 .6; %Vis
1 1 0; %FP
.67 .67 .67; %Unassigned
0 .8 0; %DAN
.67 .67 .67; %Unassigned2
0 .6 .6;%VAN
0 0 0; % Sal
.3 0 .6; %CON
.2 1 1; %SMd
1 .5 0; % SMl
.6 .2 1; %Aud
0 .2 .4; %Tpole
.2 1 .2; %MTL
0 0 1; %PMN
.8 .8 .6]; %PON
load↙
('/Users/dianaperez/Desktop/Research/Lateralization/lateralization_code/testing_output/HC↙
P384_networksxHem.mat')
lh_numvars = [];
rh_numvars = [];
for net = 1:16
vars_LH = []; vars_RH = [];
vars_LH = networksxHem.surfaceLH(find(networksxHem.surfaceLH(:,net)>0), net);
if length(vars_LH)>0
lh_numvars(net) = mean(vars_LH);
else
lh_numvars(net) = 0;
```

```
end
vars_RH = networksxHem.surfaceRH(find(networksxHem.surfaceRH(:,net)>0), net);
if length(vars_RH)>0
rh_numvars(net) = mean(vars_RH);
else
rh_numvars(net) = 0;
end
end
scatter(lh_numvars, rh_numvars, 80, rgb_colors, 'filled')
hold on
scatter(lh_numvars, rh_numvars, 80, 'k')
%axis([0 2.5 0 2.5])
axis([200 700 200 700])
line = refline(1,0);
line.Color = 'black';
xlabel('Left Hemisphere')
ylabel('Right Hemisphere')
ax = gca;
ax.FontSize = 24;
for net = 1:16
se_lh(net) = std(networksxHem.surfaceLH(:,net))/sqrt(384);
se_rh(net) = std(networksxHem.surfaceRH(:,net))/sqrt(384);
end
h = errorbar(lh_numvars, rh_numvars, se_rh, se_rh, se_lh, se_lh, 'o', 'MarkerSize', 10)
h.Color = [0,0,0];
var_freq_size_net
addpath(genpath('/Users/dianaperez/Documents/Dependencies/'))
var_freq_size_net
addpath(genpath('/Users/dianaperez/Desktop/Organization/CNS_analyses/Dependencies/'))
var_freq_size_net
addpath
addpath help
help addpath
rmpath(genpath('/Users/dianaperez/Desktop/Organization/CNS_analyses/Dependencies/'))
addpath(genpath('/Users/dianaperez/Documents/Dependencies/'))
var_freq_size_net
rgb_colors = [1 0 0; %DMN
0 0 .6; %Vis
1 1 0; %FP
.67 .67 .67; %Unassigned
0 .8 0; %DAN
.67 .67 .67; %Unassigned2
0 .6 .6;%VAN
0 0 0; % Sal
.3 0 .6; %CON
.2 1 1; %SMd
1 .5 0; % SMl
.6 .2 1; %Aud
0 .2 .4; %Tpole
.2 1 .2; %MTL
0 0 1; %PMN
.8 .8 .6]; %PON
load↙
('/Users/dianaperez/Desktop/Research/Lateralization/lateralization_code/testing_output/HC↙
P384_networksxHem.mat')
lh_numvars = [];
rh_numvars = [];
for net = 1:16
vars_LH = []; vars_RH = [];
vars_LH = networksxHem.surfaceLH(find(networksxHem.surfaceLH(:,net)>0), net);
```

```
if length(vars_LH)>0
lh_numvars(net) = mean(vars_LH);
else
lh_numvars(net) = 0;
end
vars_RH = networksxHem.surfaceRH(find(networksxHem.surfaceRH(:,net)>0), net);
if length(vars_RH)>0
rh_numvars(net) = mean(vars_RH);
else
rh_numvars(net) = 0;
end
end
scatter(lh_numvars, rh_numvars, 80, rgb_colors, 'filled')
hold on
scatter(lh_numvars, rh_numvars, 80, 'k')
%axis([0 2.5 0 2.5])
axis([200 700 200 700])
line = refline(1,0);
line.Color = 'black';
xlabel('Left Hemisphere')
ylabel('Right Hemisphere')
ax = gca;
ax.FontSize = 24;
for net = 1:16
se_lh(net) = std(networksxHem.surfaceLH(:,net))/sqrt(384);
se_rh(net) = std(networksxHem.surfaceRH(:,net))/sqrt(384);
end
h = errorbar(lh_numvars, rh_numvars, se_rh, se_rh, se_lh, se_lh, 'o', 'MarkerSize', 10)
h.Color = [0,0,0];
print(gcf,↙
'/Users/dianaperez/Desktop/Research/lateralization_code/HCP384_variant_territory_scatterp↙
lot.jpg', '-dpng', '-r300')
vars_LH = networksxHem.surfaceLH(find(networksxHem.surfaceLH(:,14)>0), 14);
vars_RH = networksxHem.surfaceLH(find(networksxHem.surfaceRH(:,14)>0), 14);
vars_RH = networksxHem.surfaceRH(find(networksxHem.surfaceRH(:,14)>0), 14);
load↙
('/Users/dianaperez/Desktop/Research/Lateralization/lateralization_code/testing_output/HC↙
P384_networksxHem.mat')
lh_numvars = [];
rh_numvars = [];
for net = 1:16
vars_LH = []; vars_RH = [];
if length(vars_LH)>30 || length(vars_RH)>30
vars_LH = networksxHem.surfaceLH(find(networksxHem.surfaceLH(:,net)>0), net);
if length(vars_LH)>0
lh_numvars(net) = mean(vars_LH);
else
lh_numvars(net) = 0;
end
vars_RH = networksxHem.surfaceRH(find(networksxHem.surfaceRH(:,net)>0), net);
if length(vars_RH)>0
rh_numvars(net) = mean(vars_RH);
else
rh_numvars(net) = 0;
end
else
lh_numvars = 0;
rh_numvars = 0;
end
end
```

```
scatter(lh_numvars, rh_numvars, 80, rgb_colors, 'filled')
hold on
scatter(lh_numvars, rh_numvars, 80, 'k')
lh_numvars = [];
rh_numvars = [];
for net = 1:16
vars_LH = []; vars_RH = [];
if length(vars_LH)>30 || length(vars_RH)>30
vars_LH = networksxHem.surfaceLH(find(networksxHem.surfaceLH(:,net)>0), net);
if length(vars_LH)>0
lh_numvars(net) = mean(vars_LH);
else
lh_numvars(net) = 0;
end
vars_RH = networksxHem.surfaceRH(find(networksxHem.surfaceRH(:,net)>0), net);
if length(vars_RH)>0
rh_numvars(net) = mean(vars_RH);
else
rh_numvars(net) = 0;
end
else
lh_numvars(net) = 0;
rh_numvars(net) = 0;
end
end
scatter(lh_numvars, rh_numvars, 80, rgb_colors, 'filled')
hold on
scatter(lh_numvars, rh_numvars, 80, 'k')
var_territory_scatterplot
load↙
('/Users/dianaperez/Desktop/Research/Lateralization/lateralization_code/testing_output/HC↙
P384_networksxHem.mat')
clear all
load↙
('/Users/dianaperez/Desktop/Research/Lateralization/lateralization_code/testing_output/HC↙
P384_networksxHem.mat')
var_territory_scatterplot
close gcf
var_territory_scatterplot
clear all
var_freq_size_net
find(Lhem(:,1)==Lhem_var_IDs(v))
num_verts = length(verts)
surf_area = sum(surf_areas_LHem(verts))
Lhem(verts,2)
sub_info(v,:) = [Lhem_var_IDs(v) num_verts surf_area net]
var_freq_size_net
clear all
var_freq_size_net
% Network assignment
network_names = {'DMN'  'Vis'   'FP'    'DAN'   'Lang'  'Sal'   'CO'    'SMd'   'SMl'↙
'Aud'   'Tpole' 'MTL'   'PMN'   'PON'};
good_nets_LH = [networksxHem.verticesLH(:,1:3) networksxHem.verticesLH(:,5) networksxHem.↙
verticesLH(:,7:end)];
good_nets_RH = [networksxHem.verticesRH(:,1:3) networksxHem.verticesRH(:,5) networksxHem.↙
verticesRH(:,7:end)];
good_nets_LH = mean(good_nets_LH);
good_nets_RH = mean(good_nets_RH);
means = [good_nets_LH' good_nets_RH'];
bar(1:14, means)
```

```
legend('Left Hem', 'Right Hem')
xticks(1:14)
xticklabels(network_names)
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.5, 0.7, 0.9, 0.7]);
ylabel('Average Number of Variant vertices');
xlabel('Network');
title('Variant vertices Assigned to Each Network Across Hemispheres');
ax = gca;
ax.FontSize = 24;
print(gcf,[output_dir cell2mat(out_str(g)) '_netAssignment_verts.jpg'],'-dpng','-r300');
rgb_colors = [1 0 0; %DMN
0 0 .6; %Vis
1 1 0; %FP
.67 .67 .67; %Unassigned
0 .8 0; %DAN
.67 .67 .67; %Unassigned2
0 .6 .6;%VAN
0 0 0; % Sal
.3 0 .6; %CON
.2 1 1; %SMd
1 .5 0; % SMl
.6 .2 1; %Aud
0 .2 .4; %Tpole
.2 1 .2; %MTL
0 0 1; %PMN
.8 .8 .6]; %PON
lh_numvars = [];
rh_numvars = [];
for net = 1:16
vars_LH = []; vars_RH = [];
vars_LH = networksxHem.verticesLH(find(networksxHem.verticesLH(:,net)>0), net);
if length(vars_LH)>30 || length(vars_RH)>30
if length(vars_LH)>0
lh_numvars(net) = mean(vars_LH);
else
lh_numvars(net) = 0;
end
vars_RH = networksxHem.verticesRH(find(networksxHem.verticesRH(:,net)>0), net);
if length(vars_RH)>0
rh_numvars(net) = mean(vars_RH);
else
rh_numvars(net) = 0;
end
else
lh_numvars(net) = 0;
rh_numvars(net) = 0;
end
end
scatter(lh_numvars, rh_numvars, 80, rgb_colors, 'filled')
hold on
scatter(lh_numvars, rh_numvars, 80, 'k')
%axis([0 2.5 0 2.5])
%axis([200 700 200 700])
line = refline(1,0);
line.Color = 'black';
xlabel('Left Hemisphere')
ylabel('Right Hemisphere')
ax = gca;
ax.FontSize = 24;
for net = 1:16
```

```
%se_lh(net) = std(networksxHem.surfaceLH(:,net))/sqrt(384);
se_lh(net) = std(vars_LH)/sqrt(length(vars_LH));
%se_rh(net) = std(networksxHem.surfaceRH(:,net))/sqrt(384);
se_rh(net) = std(vars_RH)/sqrt(length(vars_RH));
end
h = errorbar(lh_numvars, rh_numvars, se_rh, se_rh, se_lh, se_lh, 'o', 'MarkerSize', 10)
h.Color = [0,0,0];
mean(vars_LH)
mean(vars_RH)
mean(networksxHem.verticesLH(find(networksxHem.verticesLH(:,net)>0), net))
mean(networksxHem.verticesLH(:, 7))
mean(networksxHem.verticesRH(:, 7))
mean(networksxHem.verticesLH(find(networksxHem.verticesLH(:,7)>0), 7))
mean(networksxHem.verticesRH(:, 7))
mean(networksxHem.verticesRH(find(networksxHem.verticesRH(:,7)>0), 7))
mean(networksxHem.verticesLH(:, 7)) -  mean(networksxHem.verticesRH(:, 7))
mean(networksxHem.verticesLH(find(networksxHem.verticesLH(:,7)>0), 7)) - mean↙
(networksxHem.verticesRH(find(networksxHem.verticesRH(:,7)>0), 7))
%-- 7/11/22, 12:22 PM --%
var_freq_size_net
leftHem = variants_info.left_hem.group_avg{:,4};
rightHem = variants_info.right_hem.group_avg{:,4};
[h,mu,sigma,q,notch] = al_goodplot(leftHem,0.1,.2,[ 0    0.4470    0.7410],'left');
[h,mu,sigma,q,notch] = al_goodplot(rightHem,0.11,.2,[0.8500    0.3250↙
0.0980],'right');
xticks([0.105])
xticklabels('Average Total Variant Territory')
ylabel('Surface Area in mm^2')
axis([-0.2, 0.5, min([leftHem; rightHem])-std([leftHem; rightHem]), max([leftHem;↙
rightHem])+std([leftHem; rightHem])])
ax = gca;
ax.FontSize = 24;
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.3, 0.9]); %first and second↙
control position on screen, third controls width, and fourth controls height
m = findobj(gca, 'Type', 'Scatter');
hleg1 = legend(m(1:2), 'Right Hemisphere', 'Left Hemisphere', 'Location',↙
'SouthOutside');
print(gcf, [output_dir cell2mat(out_str(g)) '_avgVarTerritory_mm2.jpg'], '-dpng', '-↙
r300')
leftHem = variants_info.left_hem.group_avg{:,5};
rightHem = variants_info.right_hem.group_avg{:,5};
[h,mu,sigma,q,notch] = al_goodplot(leftHem,0.1,.2,[ 0    0.4470    0.7410],'left');
[h,mu,sigma,q,notch] = al_goodplot(rightHem,0.11,.2,[0.8500    0.3250↙
0.0980],'right');
xticks([0.105])
xticklabels('Average Variant Size')
ylabel('Surface area (mm^2)')
axis([-0.2, 0.5, min([leftHem; rightHem])-std([leftHem; rightHem]), max([leftHem;↙
rightHem])+std([leftHem; rightHem])])
ax = gca;
ax.FontSize = 24;
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.3, 0.9]); %first and second↙
control position on screen, third controls width, and fourth controls height
m = findobj(gca, 'Type', 'Scatter');
hleg1 = legend(m(1:2), 'Right Hemisphere', 'Left Hemisphere', 'Location',↙
'SouthOutside');
print(gcf, [output_dir cell2mat(out_str(g)) '_avgSizeSurfArea.jpg'], '-dpng', '-r300')
network_names = {'DMN'  'Vis'   'FP'    'DAN'   'Lang'  'Sal'   'CO'    'SMd'   'SMl'↙
'Aud'   'Tpole' 'MTL'   'PMN'   'PON'};
good_nets_LH = [networksxHem.clustersLH(:,1:3) networksxHem.verticesLH(:,5) networksxHem.↙
```

```
verticesLH(:,7:end)];
good_nets_RH = [networksxHem.clustersRH(:,1:3) networksxHem.verticesRH(:,5) networksxHem.↙
verticesRH(:,7:end)];
good_nets_LH = mean(good_nets_LH);
good_nets_RH = mean(good_nets_RH);
means = [good_nets_LH' good_nets_RH'];
bar(1:14, means)
legend('Left Hem', 'Right Hem')
xticks(1:14)
xticklabels(network_names)
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.5, 0.7, 0.9, 0.7]);
ylabel('Average Number of Variant vertices');
xlabel('Network');
title('Variant vertices Assigned to Each Network Across Hemispheres');
ax = gca;
ax.FontSize = 24;
network_names = {'DMN'  'Vis'   'FP'    'DAN'   'Lang'  'Sal'   'CO'    'SMd'   'SMl'↙
'Aud'   'Tpole' 'MTL'   'PMN'   'PON'};
good_nets_LH = [networksxHem.clustersLH(:,1:3) networksxHem.clustersLH(:,5) networksxHem.↙
clustersLH(:,7:end)];
good_nets_RH = [networksxHem.clustersRH(:,1:3) networksxHem.clustersRH(:,5) networksxHem.↙
clustersRH(:,7:end)];
good_nets_LH = mean(good_nets_LH);
good_nets_RH = mean(good_nets_RH);
means = [good_nets_LH' good_nets_RH'];
bar(1:14, means)
legend('Left Hem', 'Right Hem')
xticks(1:14)
xticklabels(network_names)
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.5, 0.7, 0.9, 0.7]);
ylabel('Average Number of Variant vertices');
xlabel('Network');
title('Variant vertices Assigned to Each Network Across Hemispheres');
ax = gca;
ax.FontSize = 24;
title('Variant vertices Assigned to Each Network Across Hemispheres');
title('Variants Assigned to Each Network Across Hemispheres');
print(gcf,[output_dir cell2mat(out_str(g)) '_netAssignment_clusters.jpg'],'-dpng','-↙
r300');
network_names = {'DMN'  'Vis'   'FP'    'DAN'   'Lang'  'Sal'   'CO'    'SMd'   'SMl'↙
'Aud'   'Tpole' 'MTL'   'PMN'   'PON'};
good_nets_LH = [networksxHem.surfaceLH(:,1:3) networksxHem.surfaceLH(:,5) networksxHem.↙
surfaceLH(:,7:end)];
good_nets_RH = [networksxHem.surfaceRH(:,1:3) networksxHem.surfaceRH(:,5) networksxHem.↙
surfaceRH(:,7:end)];
good_nets_LH = mean(good_nets_LH);
good_nets_RH = mean(good_nets_RH);
means = [good_nets_LH' good_nets_RH'];
bar(1:14, means)
legend('Left Hem', 'Right Hem')
xticks(1:14)
xticklabels(network_names)
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.5, 0.7, 0.9, 0.7]);
ylabel('Surface Area (mm^2)');
xlabel('Network');
title('Variant Territory Assigned to Each Network Across Hemispheres');
ax = gca;
ax.FontSize = 24;
print(gcf,[output_dir cell2mat(out_str(g)) '_netAssignment_territorymm2.jpg'],'-dpng','-↙
r300');
```

```
network_names = {'DMN'  'Vis'   'FP'    'DAN'   'Lang'  'Sal'   'CO'    'SMd'   'SMl'↙
'Aud'   'Tpole' 'MTL'   'PMN'   'PON'};
good_nets_LH = [networksxHem.avgSizeLH(:,1:3) networksxHem.avgSizeLH(:,5) networksxHem.↙
avgSizeLH(:,7:end)];
good_nets_RH = [networksxHem.avgSizeRH(:,1:3) networksxHem.avgSizeRH(:,5) networksxHem.↙
avgSizeRH(:,7:end)];
good_nets_LH = mean(good_nets_LH);
good_nets_RH = mean(good_nets_RH);
means = [good_nets_LH' good_nets_RH'];
bar(1:14, means)
legend('Left Hem', 'Right Hem')
xticks(1:14)
xticklabels(network_names)
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.5, 0.7, 0.9, 0.7]);
ylabel('Surface Area (mm^2)');
xlabel('Network');
title('Average Size of Variants Assigned to Each Network Across Hemispheres');
ax = gca;
ax.FontSize = 24;
print(gcf,[output_dir cell2mat(out_str(g)) '_netAssignment_varSizemm2.jpg'],'-dpng','-↙
r300');
perms_var_freq_size
title_str = 'Average Variant Territory in Surface Area Across Hemispheres';
y_label = 'Difference in Average Variant Territory in Surface Area (left hem - right↙
hem)';
outfile = [output_dir out_str '_PermutationTesting_VariantTerritorySurfArea.jpg'];
[true_diff perm_diffs] = permute_values(allSubs_info.variants_info.left_hem.group_avg{:,↙
5}, allSubs_info.variants_info.right_hem.group_avg{:,5}, flip_switch, numperms, 0);
p = min([length(find(perm_diffs<true_diff))/numperms, length(find(perm_diffs>true_diff))↙
/numperms]);
p_vals = [p_vals; p];
disp(['Average Variant Size in Surface Area (permute hemispheres) - ' num2str(p)])
output_mat = [true_diff; perm_diffs'];
save([output_dir out_str 'var_size_surf_area.mat'], 'output_mat');
if plot
title_str = 'Average Variant Size in Surface Area Across Hemispheres';
y_label = 'Difference in Average Variant Size in Surface Area (left hem - right hem)';
outfile = [output_dir out_str '_PermutationTesting_VariantSizeSurfArea.jpg'];
plot_permtesting(output_mat, title_str, y_label, outfile);
end
permute_net_assignment
save([output_dir 'network_perms_varVertices.mat'], 'output_mat');
[p_fdr p_masked] = FDR(p_vals, .025);
permute_net_assignment
scatter([1:14],good_nets(1,:), 'MarkerEdgeColor', 'k', 'MarkerFaceColor', 'k',↙
'SizeData', 50)
load↙
('/Users/dianaperez/Desktop/Research/Lateralization/lateralization_code/testing_output/ne↙
twork_perms_varVertices.mat')
network_names =↙
{'DMN','Vis','FP','DAN','Lang','Sal','CO','SMd','SMl','Aud','Tpole','MTL','PMN','PON'};
rgb_colors = [1 0 0; %DMN
0 0 .6; %Vis
1 1 0; %FP
0 .8 0; %DAN
0 .6 .6;%VAN
0 0 0; % Sal
.3 0 .6; %CON
.2 1 1; %SMd
1 .5 0; % SMl
```

```
.6 .2 1; %Aud
0 .2 .4;%Tpole
.2 1 .2; %MTL
0 0 1; %PMN
.8 .8 .6]; %PON
good_nets = [output_mat(:,1:3) output_mat(:,5) output_mat(:,7:end)];
rgb_for_plot = {};
for n = 1:numel(network_names)
rgb_for_plot{n} = rgb_colors(n,:);
end
ind = zeros(numperms+1,1);
ind(1,1) = 1;
net_inds = [ind ind ind ind ind ind ind ind ind ind ind ind ind ind];
handles = plotSpread(good_nets, 'categoryMarkers', {'x', '.'}, 'categoryLabels',↙
{'Permuted Differences','True Difference'}, 'distributionColors', rgb_for_plot',↙
'categoryIdx', net_inds, 'xNames', network_names)
ax = gca;
ax.FontSize = 24;
scatter([1:14],good_nets(1,:), 'MarkerEdgeColor', 'k', 'MarkerFaceColor', 'k',↙
'SizeData', 50)
scatter(6,good_nets(1,6), 'MarkerEdgeColor', 'w', 'MarkerFaceColor', 'w', 'SizeData', 50)
ylabel('Difference in Number of Variant Vertices')
%ylabel('Difference in Variant Size')
xlabel('Assigned Network')
min_ax = min(min(good_nets(:,:)))-(min(std(good_nets)/2));
max_ax = max(max(good_nets(:,:)))+(min(std(good_nets)/2));
axis([0, 15, min_ax, max_ax])
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.9, 0.7]);
print(gcf,[output_dir out_str '_PermutationTesting_networkAssignment_numVerts.jpg'],'-↙
dpng','-r300');
close gcf
mean(allSubs_info.networksxHem.clustersLH,1)
mean(allSubs_info.networksxHem.clustersLH,1)'
mean(allSubs_info.networksxHem.clustersRH,1)'
mean(allSubs_info.networksxHem.verticesRH,1)'
mean(allSubs_info.networksxHem.verticesLH,1)'
mean(allSubs_info.networksxHem.surfaceLH,1)'
mean(allSubs_info.networksxHem.surfaceRH,1)'
mean(allSubs_info.networksxHem.avgSizeRH,1)'
mean(allSubs_info.networksxHem.avgSizeLH,1)'
var_territory_scatterplot
clear all
var_territory_scatterplot
axis([100 400 100 400])
print(gcf,↙
'/Users/dianaperez/Desktop/Research/Lateralization/lateralization_code/HCP384_variant_clu↙
sters_by_net.jpg', '-dpng', '-r300')
var_territory_scatterplot
axis([1 3 1 3])
print(gcf,↙
'/Users/dianaperez/Desktop/Research/Lateralization/lateralization_code/HCP384_variant_clu↙
sters_by_net.jpg', '-dpng', '-r300')
var_territory_scatterplot
axis([100 400 100 400])
print(gcf,↙
'/Users/dianaperez/Desktop/Research/Lateralization/lateralization_code/HCP384_variant_ver↙
tices_by_net.jpg', '-dpng', '-r300')
var_territory_scatterplot
axis([200 800 200 800])
print(gcf,↙
```

```
'/Users/dianaperez/Desktop/Research/Lateralization/lateralization_code/HCP384_variant_ter↙
ritory_by_net.jpg', '-dpng', '-r300')
var_territory_scatterplot
axis([200 800 200 800])
var_territory_scatterplot
axis([50 600 50 600])
axis([20 600 20 600])
print(gcf,↙
'/Users/dianaperez/Desktop/Research/Lateralization/lateralization_code/HCP384_variant_ter↙
ritory_by_net.jpg', '-dpng', '-r300')
var_territory_scatterplot
axis([50 300 50 300])
axis([10 300 10 300])
axis([20 300 20 300])
print(gcf,↙
'/Users/dianaperez/Desktop/Research/Lateralization/lateralization_code/HCP384_variant_siz↙
e_by_net.jpg', '-dpng', '-r300')
close gcf
var_territory_scatterplot
axis([0 3 0 3])
line = refline(1,0);
line.Color = 'black';
print(gcf,↙
'/Users/dianaperez/Desktop/Research/Lateralization/lateralization_code/HCP384_variant_clu↙
sters_by_net.jpg', '-dpng', '-r300')
var_territory_scatterplot
print(gcf,↙
'/Users/dianaperez/Desktop/Research/Lateralization/lateralization_code/HCP384_variant_ver↙
tices_by_net.jpg', '-dpng', '-r300')
help ttest
load↙
('/Users/dianaperez/Desktop/Research/Lateralization/lateralization_code/testing_output/HC↙
P384_networksxHem.mat')
root_dir = '/Users/dianaperez/Desktop/Research/Lateralization/lateralization_code/'; %↙
location of code directory
surf_areas = ft_read_cifti_mod([root_dir '/needed_files/surf_areas_verts.dtseries.nii']);
surf_areas_LHem = surf_areas.data(1:29696);
surf_areas_RHem = surf_areas.data(29697:end);
clear all\
clear all
load↙
('/Users/dianaperez/Desktop/Research/Lateralization/lateralization_code/testing_output/HC↙
P384_networksxHem.mat')
root_dir = '/Users/dianaperez/Desktop/Research/Lateralization/lateralization_code/'; %↙
location of code directory
surf_areas = ft_read_cifti_mod([root_dir '/needed_files/surf_areas_verts.dtseries.nii']);
surf_areas_LHem = surf_areas.data(1:29696);
surf_areas_RHem = surf_areas.data(29697:end);
sum(surf_areas_LHem)
sum(surf_areas_RHem)
var_territory_scatterplot
axis([0 .02 0 .02])
axis([0 .01 0 .01])
print(gcf,↙
'/Users/dianaperez/Desktop/Research/Lateralization/lateralization_code/HCP384_variant_ter↙
ritory_proportion_scatterplot.jpg', '-dpng', '-r300')
%-- 7/16/22, 8:13 PM --%
cd /Volumes
%-- 8/18/22, 4:20 PM --%
perms_var_freq_size
```

```
%-- 8/19/22, 1:37 PM --%
var_freq_size_net
permute_net_assignment
order = [7,11,2,14,10,12,15,8,5,16,3,9,1];
network_names =↙
{'DMN','Vis','FP','DAN','Lang','Sal','CO','SMd','SMl','Aud','Tpole','MTL','PMN','PON'};
rgb_colors = [1 0 0; %DMN
0 0 .6; %Vis
1 1 0; %FP
0 .8 0; %DAN
0 .6 .6;%VAN
0 0 0; % Sal
.3 0 .6; %CON
.2 1 1; %SMd
1 .5 0; % SMl
.6 .2 1; %Aud
0 .2 .4;%Tpole
.2 1 .2; %MTL
0 0 1; %PMN
.8 .8 .6]; %PON
good_nets = [output_mat(:,1:3) output_mat(:,5) output_mat(:,7:end)];
rgb_for_plot = {};
for n = 1:numel(network_names)
rgb_for_plot{n} = rgb_colors(n,:);
end
ind = zeros(numperms+1,1);
ind(1,1) = 1;
nets_sorted = output_mat(:,order);
net_inds = [ind ind ind ind ind ind ind ind ind ind ind ind ind];
rgb_sorted = rgb_for_plot{order};
rgb_sorted = rgb_for_plot{:,order};
for rgb = 1:length(order)
rgb_sorted{rgb} = rgb_for_plot{order(rgb)};
end
rgb_sorted=[];
for rgb = 1:length(order)
rgb_sorted{rgb} = rgb_for_plot{order(rgb)};
end
order = [5,9,2,12,8,10,13,6,4,14,3,7,1];
nets_sorted = output_mat(:,order);
rgb_sorted=[];
for rgb = 1:length(order)
rgb_sorted{rgb} = rgb_for_plot{order(rgb)};
end
names_sorted = [];
for name = 1:length(order)
names_sorted{name} = network_names{order(name)};
end
handles = plotSpread(nets_sorted, 'categoryMarkers', {'x', '.'}, 'categoryLabels',↙
{'Permuted Differences','True Difference'}, 'distributionColors', rgb_sorted,↙
'categoryIdx', net_inds, 'xNames', names_sorted)
ax = gca;
ax.FontSize = 24;
scatter([1:13],nets_sorted(1,:), 'MarkerEdgeColor', 'k', 'MarkerFaceColor', 'k',↙
'SizeData', 50)
scatter(8,nets_sorted(1,8), 'MarkerEdgeColor', 'w', 'MarkerFaceColor', 'w', 'SizeData',↙
50)
clear all
permute_net_assignment
ylabel('Difference in Total Variant Territory')
```

```
print(gcf,[output_dir out_str '_PermutationTesting_networkAssignment_VariantTerritory.↙
jpg'],'-dpng','-r300');
close gcf
clear all
make_overlapmap
overlap_nonbrain = insert_nonbrain(overlap_map, 'both', out_cifti);
length(template.brainstructure)
length(template.brainstructure)/2
overlap_nonbrain = insert_nonbrain(overlap_map.data, 'both', template);
left = overlap_nonbrain(1:32492);
right = overlap_nonbrain(32493:end);
diff_map = left - right;
diff_map = [diff_map; diff_map];
diff_map = diff_map(template.brainstructure>0);
template.data = diff_map;
ft_write_cifti_mod(strrep(out_cifti, 'overlap', 'diff'), template)
make_overlapmap
out_cifti
make_overlapmap
clear all
make_overlapmap
max(overlap_map.data
max(overlap_map.data)
overlap_map.data*1000
max(overlap_map.data)
test = overlap_map.data*1000;
max(test)
test = overlap_map.data*100;
max(test)
overlap_map.data = test;
ft_write_cifti_mod(out_cifti, overlap_map);
if create_diff
disp('Creating difference map...')
overlap_nonbrain = insert_nonbrain(overlap_map.data, 'both', template);
left = overlap_nonbrain(1:32492);
right = overlap_nonbrain(32493:end);
diff_map = left - right;
diff_map = [diff_map; diff_map];
diff_map = diff_map(template.brainstructure>0);
template.data = diff_map;
ft_write_cifti_mod(strrep(out_cifti, 'overlap', 'diff'), template)
end
out_cifti
make_overlapmap
test = overlap_map.data*100;
max(test)
overlap_map.data = test;
make_overlapmap
max(overlap_map)
max(overlap_map.data)
make_overlapmap
wb_dir = '/Applications/workbench/bin_macosx64/';
group_avg =↙
'/Users/dianaperez/Desktop/Research/Lateralization/lateralization_code/group_avgs/120_LR_↙
minsize400_recolored_manualconsensus_LR.dlabel.nii';
borderlabel_file = '/Users/dianaperez/Downloads/wbBorderLabelFile.txt';
output_dlabel = '/Users/dianaperez/Desktop/WashU120_labelfile_fornetoutlines.dlabel.nii';
output_lefthem = '/Users/dianaperez/Desktop/WashU120_labelfile_fornetoutlines_left.label.↙
gii';
output_righthem = '/Users/dianaperez/Desktop/WashU120_labelfile_fornetoutlines_right.↙
```

```
label.gii';
system([wb_dir 'wb_command -cifti-label-import ' group_avg ' ' borderlabel_file ' '↙
output_dlabel])
system([wb_dir 'wb_command -cifti-separate ' output_dlabel ' COLUMN -label CORTEX_LEFT '↙
output_lefthem ' -label CORTEX_RIGHT ' output_righthem])
system([wb_dir 'wb_command -label-to-border↙
/Users/dianaperez/Documents/Dependencies/Resources/Conte69_atlas-v2.LR.32k_fs_LR.↙
wb/Conte69.L.midthickness.32k_fs_LR.surf.gii ' output_lefthem  ' WashU120_netborders_L.↙
border'])
system([wb_dir 'wb_command -label-to-border↙
/Users/dianaperez/Documents/Dependencies/Resources/Conte69_atlas-v2.LR.32k_fs_LR.↙
wb/Conte69.R.midthickness.32k_fs_LR.surf.gii ' output_righthem  ' WashU120_netborders_R.↙
border'])
make_overlapmap
clear all
load↙
('/Users/dianaperez/Desktop/Research/Lateralization/lateralization_code/testing_output/HC↙
P752_RH_networksxHem.mat')
good_nets_LH = [networksxHem.surfaceLH(:,1:3) networksxHem.surfaceLH(:,5) networksxHem.↙
surfaceLH(:,7:end)];
good_nets_RH = [networksxHem.surfaceRH(:,1:3) networksxHem.surfaceRH(:,5) networksxHem.↙
surfaceRH(:,7:end)];
good_nets_LH = mean(good_nets_LH);
good_nets_RH = mean(good_nets_RH);
means = [good_nets_LH' good_nets_RH'];
bar(1:14, means)
legend('Left Hem', 'Right Hem')
xticks(1:14)
xticklabels(network_names)
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.5, 0.7, 0.9, 0.7]);
ylabel('Average Total Variant Territory');
network_names = {'DMN'  'Vis'   'FP'    'DAN'   'Lang'  'Sal'   'CO'    'SMd'   'SMl'↙
'Aud'   'Tpole' 'MTL'   'PMN'   'PON'};
xticklabels(network_names)
title('Variant Territory Assigned to Each Network Across Hemispheres - Right Handers');
ax = gca;
ax.FontSize = 24;
print(gcf, '/Users/dianaperez/Desktop/HCP752_RightHanders_netAssignment_VariantTerritory.↙
jpg'],'-dpng','-r300');
print(gcf, '/Users/dianaperez/Desktop/HCP752_RightHanders_netAssignment_VariantTerritory.↙
jpg','-dpng','-r300');
title('Variant Territory Across Networks - Right Handers');
ylabel('Average Variant Territory (mm^2)');
print(gcf, '/Users/dianaperez/Desktop/HCP752_RightHanders_netAssignment_VariantTerritory.↙
jpg','-dpng','-r300');
close gcf
load↙
('/Users/dianaperez/Desktop/Research/Lateralization/lateralization_code/testing_output/HC↙
P752_LH_networksxHem.mat')
good_nets_LH = [networksxHem.surfaceLH(:,1:3) networksxHem.surfaceLH(:,5) networksxHem.↙
surfaceLH(:,7:end)];
good_nets_RH = [networksxHem.surfaceRH(:,1:3) networksxHem.surfaceRH(:,5) networksxHem.↙
surfaceRH(:,7:end)];
good_nets_LH = mean(good_nets_LH);
good_nets_RH = mean(good_nets_RH);
means = [good_nets_LH' good_nets_RH'];
bar(1:14, means)
legend('Left Hem', 'Right Hem')
xticks(1:14)
xticklabels(network_names)
```

```
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.5, 0.7, 0.9, 0.7]);
title('Variant Territory Assigned to Each Network Across Hemispheres - Left Handers');
ylabel('Average Variant Territory (mm^2)');
ax = gca;
ax.FontSize = 24;
print(gcf, '/Users/dianaperez/Desktop/HCP752_LeftHanders_netAssignment_VariantTerritory.↙
jpg','-dpng','-r300');
load↙
('/Users/dianaperez/Desktop/Research/Lateralization/lateralization_code/testing_output/HC↙
P752_RH_networksxHem.mat')
good_nets_LH = [networksxHem.surfaceLH(:,1:3) networksxHem.surfaceLH(:,5) networksxHem.↙
surfaceLH(:,7:end)];
good_nets_RH = [networksxHem.surfaceRH(:,1:3) networksxHem.surfaceRH(:,5) networksxHem.↙
surfaceRH(:,7:end)];
good_nets_LH = mean(good_nets_LH);
good_nets_RH = mean(good_nets_RH);
means = [good_nets_LH' good_nets_RH'];
bar(1:14, means)
legend('Left Hem', 'Right Hem')
xticks(1:14)
xticklabels(network_names)
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.5, 0.7, 0.9, 0.7]);
ax = gca;
ax.FontSize = 24;
title('Variant Territory Across Networks - Right Handers');
ylabel('Average Variant Territory (mm^2)');
print(gcf, '/Users/dianaperez/Desktop/HCP752_RightHanders_netAssignment_VariantTerritory.↙
jpg','-dpng','-r300');
close gcf
load↙
('/Users/dianaperez/Desktop/Research/Lateralization/lateralization_code/testing_output/HC↙
P752_new_split_LH_networksxHem.mat')
network_names = {'DMN'  'Vis'   'FP'    'DAN'   'Lang'  'Sal'   'CO'    'SMd'   'SMl'↙
'Aud'   'Tpole' 'MTL'   'PMN'   'PON'};
%good_nets_LH = [networksxHem.verticesLH(:,1:3) networksxHem.verticesLH(:,5)↙
networksxHem.verticesLH(:,7:end)];
good_nets_LH = [networksxHem.surfaceLH(:,1:3) networksxHem.surfaceLH(:,5) networksxHem.↙
surfaceLH(:,7:end)];
good_nets_RH = [networksxHem.surfaceRH(:,1:3) networksxHem.surfaceRH(:,5) networksxHem.↙
surfaceRH(:,7:end)];
good_nets_LH = mean(good_nets_LH);
good_nets_RH = mean(good_nets_RH);
means = [good_nets_LH' good_nets_RH'];
for net = 1:16
se_lh(net) = std(networksxHem.surfaceLH(:,net))/sqrt(40);
se_rh(net) = std(networksxHem.surfaceRH(:,net))/sqrt(40);
end
se_lh(4) = [];
se_lh(5) = [];
se_rh(4) = [];
se_rh(5) = [];
bar(1:14, means)
legend('Left Hem', 'Right Hem')
xticks(1:14)
xticklabels(network_names)
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.5, 0.7, 0.9, 0.7]);
%ylabel('Average Number of Variant Regions')
ylabel('Average Variant Territory (mm^2)');
xlabel('Network');
%title('Variant Regions Assigned to Each Network Across Hemispheres')
```

```
title('Variant Territory Across Networks - Right Handers');
ax = gca;
ax.FontSize = 24;
hold on
h = errorbar(.85:1:13.85, means(:,1), se_lh, se_lh)
h.Color = [0,0,0];
g = errorbar(1.15:1:14.15, means(:,2), se_rh, se_rh)
g.Color = [0,0,0];
h.LineStyle = 'none';
g.LineStyle = 'none';
h.LineWidth = 2;
g.LineWidth = 2;
legend('Left Hem', 'Right Hem')
clear all
load↙
('/Users/dianaperez/Desktop/Research/Lateralization/lateralization_code/testing_output/HC↙
P752_new_split_LH_networksxHem.mat')
network_names = {'DMN'  'Vis'   'FP'    'DAN'   'Lang'  'Sal'   'CO'    'SMd'   'SMl'↙
'Aud'   'Tpole' 'MTL'   'PMN'   'PON'};
%good_nets_LH = [networksxHem.verticesLH(:,1:3) networksxHem.verticesLH(:,5)↙
networksxHem.verticesLH(:,7:end)];
good_nets_LH = [networksxHem.surfaceLH(:,1:3) networksxHem.surfaceLH(:,5) networksxHem.↙
surfaceLH(:,7:end)];
good_nets_RH = [networksxHem.surfaceRH(:,1:3) networksxHem.surfaceRH(:,5) networksxHem.↙
surfaceRH(:,7:end)];
good_nets_LH = mean(good_nets_LH);
good_nets_RH = mean(good_nets_RH);
means = [good_nets_LH' good_nets_RH'];
load↙
('/Users/dianaperez/Desktop/Research/Lateralization/lateralization_code/testing_output/HC↙
P752_LH_networksxHem.mat')
load↙
('/Users/dianaperez/Desktop/Research/Lateralization/lateralization_code/testing_output/HC↙
P752_LH_networksxHem.mat')
%load↙
('/Users/dianaperez/Desktop/Research/Lateralization/lateralization_code/testing_output/HC↙
P752_new_split_LH_networksxHem.mat')
network_names = {'DMN'  'Vis'   'FP'    'DAN'   'Lang'  'Sal'   'CO'    'SMd'   'SMl'↙
'Aud'   'Tpole' 'MTL'   'PMN'   'PON'};
%good_nets_LH = [networksxHem.verticesLH(:,1:3) networksxHem.verticesLH(:,5)↙
networksxHem.verticesLH(:,7:end)];
good_nets_LH = [networksxHem.surfaceLH(:,1:3) networksxHem.surfaceLH(:,5) networksxHem.↙
surfaceLH(:,7:end)];
good_nets_RH = [networksxHem.surfaceRH(:,1:3) networksxHem.surfaceRH(:,5) networksxHem.↙
surfaceRH(:,7:end)];
good_nets_LH = mean(good_nets_LH);
good_nets_RH = mean(good_nets_RH);
means = [good_nets_LH' good_nets_RH'];
for net = 1:16
se_lh(net) = std(networksxHem.surfaceLH(:,net))/sqrt(40);
se_rh(net) = std(networksxHem.surfaceRH(:,net))/sqrt(40);
end
se_lh(4) = [];
se_lh(5) = [];
se_rh(4) = [];
se_rh(5) = [];
bar(1:14, means)
legend('Left Hem', 'Right Hem')
xticks(1:14)
xticklabels(network_names)
```

```
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.5, 0.7, 0.9, 0.7]);
%ylabel('Average Number of Variant Regions')
ylabel('Average Variant Territory (mm^2)');
xlabel('Network');
%title('Variant Regions Assigned to Each Network Across Hemispheres')
title('Variant Territory Across Networks - Right Handers');
ax = gca;
ax.FontSize = 24;
hold on
h = errorbar(.85:1:13.85, means(:,1), se_lh, se_lh)
h.Color = [0,0,0];
g = errorbar(1.15:1:14.15, means(:,2), se_rh, se_rh)
g.Color = [0,0,0];
h.LineStyle = 'none';
g.LineStyle = 'none';
h.LineWidth = 2;
g.LineWidth = 2;
legend('Left Hem', 'Right Hem')
print(gcf, '/Users/dianaperez/Desktop/HCP752_numvars_Lhand_leftvrighthem.jpg', '-dpng',↙
'-r300')
close gcf
load↙
('/Users/dianaperez/Desktop/Research/Lateralization/lateralization_code/testing_output/HC↙
P752_RH_networksxHem.mat')
network_names = {'DMN'  'Vis'   'FP'    'DAN'   'Lang'  'Sal'   'CO'    'SMd'   'SMl'↙
'Aud'   'Tpole' 'MTL'   'PMN'   'PON'};
%good_nets_LH = [networksxHem.verticesLH(:,1:3) networksxHem.verticesLH(:,5)↙
networksxHem.verticesLH(:,7:end)];
good_nets_LH = [networksxHem.surfaceLH(:,1:3) networksxHem.surfaceLH(:,5) networksxHem.↙
surfaceLH(:,7:end)];
good_nets_RH = [networksxHem.surfaceRH(:,1:3) networksxHem.surfaceRH(:,5) networksxHem.↙
surfaceRH(:,7:end)];
good_nets_LH = mean(good_nets_LH);
good_nets_RH = mean(good_nets_RH);
means = [good_nets_LH' good_nets_RH'];
for net = 1:16
se_lh(net) = std(networksxHem.surfaceLH(:,net))/sqrt(670);
se_rh(net) = std(networksxHem.surfaceRH(:,net))/sqrt(670);
end
se_lh(4) = [];
se_lh(5) = [];
se_rh(4) = [];
se_rh(5) = [];
bar(1:14, means)
legend('Left Hem', 'Right Hem')
xticks(1:14)
xticklabels(network_names)
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.5, 0.7, 0.9, 0.7]);
ylabel('Average Variant Territory (mm^2)');
xlabel('Network');
title('Variant Territory Across Networks - Right Handers');
%title('Variant Regions Assigned to Each Network Across Hemispheres')
ax = gca;
ax.FontSize = 24;
hold on
h = errorbar(.85:1:13.85, means(:,1), se_lh, se_lh)
h.Color = [0,0,0];
g = errorbar(1.15:1:14.15, means(:,2), se_rh, se_rh)
g.Color = [0,0,0];
h.LineStyle = 'none';
```

```
g.LineStyle = 'none';
h.LineWidth = 2;
g.LineWidth = 2;
legend('Left Hem', 'Right Hem')
axis([0,15,0,2.5])
close gcf
load↙
('/Users/dianaperez/Desktop/Research/Lateralization/lateralization_code/testing_output/HC↙
P752_RH_networksxHem.mat')
network_names = {'DMN'  'Vis'   'FP'    'DAN'   'Lang'  'Sal'   'CO'    'SMd'   'SMl'↙
'Aud'   'Tpole' 'MTL'   'PMN'   'PON'};
%good_nets_LH = [networksxHem.verticesLH(:,1:3) networksxHem.verticesLH(:,5)↙
networksxHem.verticesLH(:,7:end)];
good_nets_LH = [networksxHem.surfaceLH(:,1:3) networksxHem.surfaceLH(:,5) networksxHem.↙
surfaceLH(:,7:end)];
good_nets_RH = [networksxHem.surfaceRH(:,1:3) networksxHem.surfaceRH(:,5) networksxHem.↙
surfaceRH(:,7:end)];
good_nets_LH = mean(good_nets_LH);
good_nets_RH = mean(good_nets_RH);
means = [good_nets_LH' good_nets_RH'];
for net = 1:16
se_lh(net) = std(networksxHem.surfaceLH(:,net))/sqrt(670);
se_rh(net) = std(networksxHem.surfaceRH(:,net))/sqrt(670);
end
se_lh(4) = [];
se_lh(5) = [];
se_rh(4) = [];
se_rh(5) = [];
bar(1:14, means)
legend('Left Hem', 'Right Hem')
xticks(1:14)
xticklabels(network_names)
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.5, 0.7, 0.9, 0.7]);
%ylabel('Average Number of Variant Regions')
ylabel('Average Variant Territory (mm^2)');
xlabel('Network');
title('Variant Territory Across Networks - Right Handers');
%title('Variant Regions Assigned to Each Network Across Hemispheres')
ax = gca;
ax.FontSize = 24;
hold on
h = errorbar(.85:1:13.85, means(:,1), se_lh, se_lh)
h.Color = [0,0,0];
g = errorbar(1.15:1:14.15, means(:,2), se_rh, se_rh)
g.Color = [0,0,0];
h.LineStyle = 'none';
g.LineStyle = 'none';
h.LineWidth = 2;
g.LineWidth = 2;
legend('Left Hem', 'Right Hem')
print(gcf, '/Users/dianaperez/Desktop/HCP752_numvars_Rhand_leftvrighthem.jpg', '-dpng',↙
'-r300')
close gcf
load↙
('/Users/dianaperez/Desktop/Research/Lateralization/lateralization_code/testing_output/HC↙
P752_LH_networksxHem.mat')
%load↙
('/Users/dianaperez/Desktop/Research/Lateralization/lateralization_code/testing_output/HC↙
P752_new_split_LH_networksxHem.mat')
network_names = {'DMN'  'Vis'   'FP'    'DAN'   'Lang'  'Sal'   'CO'    'SMd'   'SMl'↙
```

```
'Aud'   'Tpole' 'MTL'   'PMN'   'PON'};
%good_nets_LH = [networksxHem.verticesLH(:,1:3) networksxHem.verticesLH(:,5)↙
networksxHem.verticesLH(:,7:end)];
good_nets_LH = [networksxHem.surfaceLH(:,1:3) networksxHem.surfaceLH(:,5) networksxHem.↙
surfaceLH(:,7:end)];
good_nets_RH = [networksxHem.surfaceRH(:,1:3) networksxHem.surfaceRH(:,5) networksxHem.↙
surfaceRH(:,7:end)];
good_nets_LH = mean(good_nets_LH);
good_nets_RH = mean(good_nets_RH);
means = [good_nets_LH' good_nets_RH'];
for net = 1:16
se_lh(net) = std(networksxHem.surfaceLH(:,net))/sqrt(40);
se_rh(net) = std(networksxHem.surfaceRH(:,net))/sqrt(40);
end
se_lh(4) = [];
se_lh(5) = [];
se_rh(4) = [];
se_rh(5) = [];
bar(1:14, means)
legend('Left Hem', 'Right Hem')
xticks(1:14)
xticklabels(network_names)
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.5, 0.7, 0.9, 0.7]);
%ylabel('Average Number of Variant Regions')
ylabel('Average Variant Territory (mm^2)');
xlabel('Network');
%title('Variant Regions Assigned to Each Network Across Hemispheres')
title('Variant Territory Across Networks - Left Handers');
ax = gca;
ax.FontSize = 24;
hold on
h = errorbar(.85:1:13.85, means(:,1), se_lh, se_lh)
h.Color = [0,0,0];
g = errorbar(1.15:1:14.15, means(:,2), se_rh, se_rh)
g.Color = [0,0,0];
h.LineStyle = 'none';
g.LineStyle = 'none';
h.LineWidth = 2;
g.LineWidth = 2;
legend('Left Hem', 'Right Hem')
%print(gcf,↙
'/Users/dianaperez/Desktop/Research/lateralization_code/HCP752_numvars_Lhand_leftvrighthe↙
m.jpg', '-dpng', '-r300')
print(gcf, '/Users/dianaperez/Desktop/HCP752_numvars_Lhand_leftvrighthem.jpg', '-dpng',↙
'-r300')
close gcf
left_handers = networksxHem;
%% right handers
load↙
('/Users/dianaperez/Desktop/Research/Lateralization/lateralization_code/testing_output/HC↙
P752_RH_networksxHem.mat')
network_names = {'DMN'  'Vis'   'FP'    'DAN'   'Lang'  'Sal'   'CO'    'SMd'   'SMl'↙
'Aud'   'Tpole' 'MTL'   'PMN'   'PON'};
%good_nets_LH = [networksxHem.verticesLH(:,1:3) networksxHem.verticesLH(:,5)↙
networksxHem.verticesLH(:,7:end)];
good_nets_LH = [networksxHem.surfaceLH(:,1:3) networksxHem.surfaceLH(:,5) networksxHem.↙
surfaceLH(:,7:end)];
good_nets_RH = [networksxHem.surfaceRH(:,1:3) networksxHem.surfaceRH(:,5) networksxHem.↙
surfaceRH(:,7:end)];
good_nets_LH = mean(good_nets_LH);
```

```
good_nets_RH = mean(good_nets_RH);
means = [good_nets_LH' good_nets_RH'];
for net = 1:16
se_lh(net) = std(networksxHem.surfaceLH(:,net))/sqrt(670);
se_rh(net) = std(networksxHem.surfaceRH(:,net))/sqrt(670);
end
se_lh(4) = [];
se_lh(5) = [];
se_rh(4) = [];
se_rh(5) = [];
bar(1:14, means)
legend('Left Hem', 'Right Hem')
xticks(1:14)
xticklabels(network_names)
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.5, 0.7, 0.9, 0.7]);
%ylabel('Average Number of Variant Regions')
ylabel('Average Variant Territory (mm^2)');
xlabel('Network');
title('Variant Territory Across Networks - Right Handers');
%title('Variant Regions Assigned to Each Network Across Hemispheres')
ax = gca;
ax.FontSize = 24;
hold on
h = errorbar(.85:1:13.85, means(:,1), se_lh, se_lh)
h.Color = [0,0,0];
g = errorbar(1.15:1:14.15, means(:,2), se_rh, se_rh)
g.Color = [0,0,0];
h.LineStyle = 'none';
g.LineStyle = 'none';
h.LineWidth = 2;
g.LineWidth = 2;
legend('Left Hem', 'Right Hem')
axis([0,15,0,2.5])
%print(gcf,↙
'/Users/dianaperez/Desktop/Research/lateralization_code/HCP752_numvars_Rhand_leftvrighthe↙
m.jpg', '-dpng', '-r300')
print(gcf, '/Users/dianaperez/Desktop/HCP752_numvars_Rhand_leftvrighthem.jpg', '-dpng',↙
'-r300')
close gcf
right_handers = networksxHem;
bar(1:14, means)
legend('Left Hem', 'Right Hem')
xticks(1:14)
xticklabels(network_names)
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.5, 0.7, 0.9, 0.7]);
%ylabel('Average Number of Variant Regions')
ylabel('Average Variant Territory (mm^2)');
xlabel('Network');
title('Variant Territory Across Networks - Right Handers');
%title('Variant Regions Assigned to Each Network Across Hemispheres')
ax = gca;
ax.FontSize = 24;
hold on
h = errorbar(.85:1:13.85, means(:,1), se_lh, se_lh)
h.Color = [0,0,0];
g = errorbar(1.15:1:14.15, means(:,2), se_rh, se_rh)
g.Color = [0,0,0];
h.LineStyle = 'none';
g.LineStyle = 'none';
h.LineWidth = 2;
```

```
g.LineWidth = 2;
legend('Left Hem', 'Right Hem')
%print(gcf,↙
'/Users/dianaperez/Desktop/Research/lateralization_code/HCP752_numvars_Rhand_leftvrighthe↙
m.jpg', '-dpng', '-r300')
print(gcf, '/Users/dianaperez/Desktop/HCP752_numvars_Rhand_leftvrighthem.jpg', '-dpng',↙
'-r300')
close gcf
right_handers = networksxHem;
diff_lefthanders = left_handers.surfaceLH - left_handers.surfaceRH;
mean_diff_lefthanders = mean(diff_lefthanders, 1);
diff_righthanders = right_handers.surfaceLH - right_handers.surfaceRH;
mean_diff_righthanders = mean(diff_righthanders, 1);
for net = 1:16
se_lh(net) = std(diff_lefthanders(:,net))/sqrt(40);
se_rh(net) = std(diff_righthanders(:,net))/sqrt(670);
end
se_lh(4) = [];
se_lh(5) = [];
se_rh(4) = [];
se_rh(5) = [];
diffs = [mean_diff_lefthanders; mean_diff_righthanders];
diffs(:,4) = []; diffs(:,5) = [];
b = bar(1:14, diffs)
b(1).FaceColor = [0,0,0];%[.2 .6 .5];
b(2).FaceColor = [.5,.5,.5];%[0.4940 0.1840 0.5560];
legend('Left Handers', 'Right Handers')
xticks(1:14)
xticklabels(network_names)
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.5, 0.7, 0.9, 0.7]);
ylabel(' ')
xlabel(' ');
ax = gca;
ax.FontSize = 24;
hold on
h = errorbar(.85:1:13.85, diffs(1,:), se_lh, se_lh)
h.Color = [0.5,0.5,0.5];
g = errorbar(1.15:1:14.15, diffs(2,:), se_rh, se_rh)
g.Color = [0,0,0];
h.LineStyle = 'none';
g.LineStyle = 'none';
h.LineWidth = 2;
g.LineWidth = 2;
legend('Left Handers', 'Right Handers')
close gcf
diff_lefthanders = left_handers.surfaceLH - left_handers.surfaceRH;
mean_diff_lefthanders = mean(diff_lefthanders, 1);
diff_righthanders = right_handers.surfaceLH - right_handers.surfaceRH;
mean_diff_righthanders = mean(diff_righthanders, 1);
for net = 1:16
se_lh(net) = std(diff_lefthanders(:,net))/sqrt(40);
se_rh(net) = std(diff_righthanders(:,net))/sqrt(670);
end
se_lh(4) = [];
se_lh(5) = [];
se_rh(4) = [];
se_rh(5) = [];
diffs = [mean_diff_lefthanders; mean_diff_righthanders];
diffs(:,4) = []; diffs(:,5) = [];
b = bar(1:14, diffs)
```

```
b(1).FaceColor = [.2 .6 .5];%[0,0,0];
b(2).FaceColor = [0.4940 0.1840 0.5560];%[.5,.5,.5]
legend('Left Handers', 'Right Handers')
xticks(1:14)
xticklabels(network_names)
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.5, 0.7, 0.9, 0.7]);
ylabel(' ')
xlabel(' ');
ax = gca;
ax.FontSize = 24;
hold on
h = errorbar(.85:1:13.85, diffs(1,:), se_lh, se_lh)
%h.Color = [0.5,0.5,0.5];
g = errorbar(1.15:1:14.15, diffs(2,:), se_rh, se_rh)
%g.Color = [0,0,0];
h.LineStyle = 'none';
g.LineStyle = 'none';
h.LineWidth = 2;
g.LineWidth = 2;
legend('Left Handers', 'Right Handers')
g.Color = [0,0,0];
h.Color = [0,0,0];
ylabel('Average Difference in Variant Territory (left-right hem)');
xlabel('Network');
ylabel('Average Difference in Variant Territory');
print(gcf, '/Users/dianaperez/Desktop/HCP752_numvars_LvRhand_L-Rhem.jpg', '-dpng', '-↙
r300')
permute_net_assignment
RandStream
permute_net_assignment
allSubs_info = load([data_location in_str '_LH_networksxHem.mat']);
allSubs_info = load↙
('/Users/dianaperez/Desktop/Research/Lateralization/lateralization_code/testing_output/HC↙
P752_LH_networksxHem.mat')
output_dir = [output_dir 'Left_handers_'];
permute_net_assignment
allSubs_info = load↙
('/Users/dianaperez/Desktop/Research/Lateralization/lateralization_code/testing_output/HC↙
P752_RH_networksxHem.mat')
numsubs = height(allSubs_info.networksxHem.clustersLH);
permute_net_assignment
allSubs_info = load↙
('/Users/dianaperez/Desktop/Research/Lateralization/lateralization_code/testing_output/HC↙
P752_RH_networksxHem.mat')
permute_net_assignment
allSubs_info = load↙
('/Users/dianaperez/Desktop/Research/Lateralization/lateralization_code/testing_output/HC↙
P752_RH_networksxHem.mat')
output_dir = [output_dir 'Right_handers_'];
permute_net_assignment
clear all
%-- 8/31/22, 9:38 AM --%
load↙
('/Users/dianaperez/Desktop/Research/Lateralization/lateralization_code/testing_output/HC↙
P384_variants_info.mat')
load↙
('/Users/dianaperez/Desktop/Research/Lateralization/lateralization_code/testing_output/HC↙
P384_networksxHem.mat')
numVars = variants_info.left_hem.group_avg{:,1};
[h,p,ci,stats] = ttest(variants_info.left_hem.group_avg{:,1},variants_info.right_hem.↙
```

```
group_avg{:,1});
[h,p,ci,stats] = ttest(variants_info.left_hem.group_avg{:,2},variants_info.right_hem.↙
group_avg{:,2});
[h,p,ci,stats] = ttest(variants_info.left_hem.group_avg{:,3},variants_info.right_hem.↙
group_avg{:,3});
DMN_LH = networksxHem.clustersLH(:,1);
[h,p,ci,stats] = ttest(networksxHem.clustersLH(:,1),networksxHem.clustersRH(:,1));
[h,p,ci,stats] = ttest(networksxHem.clustersLH(:,2),networksxHem.clustersRH(:,2));
[h,p,ci,stats] = ttest(networksxHem.clustersLH(:,7),networksxHem.clustersRH(:,7));
[h,p,ci,stats] = ttest(networksxHem.clustersLH(:,9),networksxHem.clustersRH(:,9));
[h,p,ci,stats] = ttest(networksxHem.clustersLH(:,11),networksxHem.clustersRH(:,11));
clear all
permute_net_assignment
addpath '/Users/dianaperez/Documents/GitHub/PerezEtAl_HemAsymmetries/needed_files'
permute_net_assignment
addpath↙
'/Users/dianaperez/Documents/GitHub/PerezEtAl_HemAsymmetries/needed_files/plotSpread/plot↙
Spread'
permute_net_assignment
clear all
library(tidyverse) #load tidyverse
data <- read.csv("C:/Users/dianaperez/Downloads/DIC_Data2022.csv")
data = readtable('/Users/dianaperez/Downloads/DIC_Data2022.csv');
DOI = data(:,18:90);
enc = DOI(~isnan(DOI(:,1)), 1:11);
help isnan
DOI(:,1)
DOI{:,1}
enc = DOI(~isnan(DOI{:,1}), 1:11);
mean_enc = mean(enc, 2);
mean_enc = mean(table2array(enc), 2);
mean_enc = mean(table2array(enc), 1);
bar(mean_enc)
groups = {'Race/Ethnicity', 'Gender', 'Sexual Orientation', 'Economic Status', 'Ability↙
Status', 'Age', 'Religion', 'Familial Obligations', 'Political Ideology',↙
'Nationality/Immigration', 'Mental Health'};
xlabel(groups)
bar(mean_enc, 1:11)
bar(1:11, mean_enc)
xlabel(groups)
help xtick
bar(1:11,mean_enc)
xticks(groups)
xticklabels(groups)
xtickangle(90)
xtickangle(70)
xtickangle(60)
yaxis([1:6])
axis([1:6])
clos gcf
close gcf
bar(1:11,mean_enc)
xticklabels(groups)
xtickangle(60)
yticks([1:6])
yticks([1:6])
help axis
axis([1 11 1 6])
axis([0 12 1 6])
answers = {'Not at all', 'A little', 'A moderate amount', 'Quite a bit', 'A great deal'};
```

```
axis([0 12 1 5])
yticklabels(answers)
ylabel(
ylabel('Average Response'
ylabel('Average Response')
title('How much do you thiunk the department actis to encourage diversity and inclusion↙
as related to:')
title(' ')
answers = {'Never', 'Once a year', 'Once/twice a quarter', 'Severla times', 'Weekly',↙
'Daily'};
imp_bias = DOI(~isnan(DOI{:,1}), 12:22);
mean_IB = mean(table2array(IB), 2);
bar(1:11,mean_IB)
xticklabels(groups)
xtickangle(60)
axis([0 12 1 6])
yticklabels(answers)
ylabel('Average Response')
print(gcf,'/Users/dianaperez/Desktop/observe_imp_bias.jpg','-dpng','-r300');
answers = {'Never', 'Once a year', 'Once/twice a quarter', 'Severla times', 'Weekly',↙
'Daily'};
imp_bias = DOI(~isnan(DOI{:,1}), 12:22);
mean_IB = mean(table2array(imp_bias), 2);
bar(1:11,mean_IB)
xticklabels(groups)
xtickangle(60)
axis([0 12 1 6])
yticklabels(answers)
ylabel('Average Response')
print(gcf,'/Users/dianaperez/Desktop/observe_imp_bias.jpg','-dpng','-r300');
imp_bias2 = DOI(~isnan(DOI{:,1}), 25:35);
mean_IB2 = mean(table2array(imp_bias2), 2);
bar(1:11,mean_IB2)
xticklabels(groups)
xtickangle(60)
axis([0 12 1 6])
yticklabels(answers)
ylabel('Average Response')
print(gcf,'/Users/dianaperez/Desktop/hear_imp_bias.jpg','-dpng','-r300');
clear mean*
mean_IB = mean(table2array(imp_bias), 2);
mean_IB = mean(table2array(imp_bias), 1);
bar(1:11,mean_IB)
xticklabels(groups)
xtickangle(60)
axis([0 12 1 6])
yticklabels(answers)
ylabel('Average Response')
print(gcf,'/Users/dianaperez/Desktop/observe_imp_bias.jpg','-dpng','-r300');
imp_bias = DOI(~isnan(DOI{:,1}), 12:22);
imp_bias(isnan(imp_bias)) = 0;
imp_bias(isnan(imp_bias{:,:})) = 0;
length(imp_bias)
width(imp_bias)
for q = 1:width(imp_bias)
col = table2array(imp_bias(~isnan(imp_bias{:,q}),q));
mean_IB(q) = mean(col);
end
bar(1:11,mean_IB)
xticklabels(groups)
```

```
xtickangle(60)
axis([0 12 1 6])
yticklabels(answers)
yticks([1:6])
yticklabels(answers)
print(gcf,'/Users/dianaperez/Desktop/observe_imp_bias.jpg','-dpng','-r300');
imp_bias2 = DOI(:, 12:22);
for q = 1:width(imp_bias2)
col = table2array(imp_bias2(~isnan(imp_bias2{:,q}),q));
mean_IB2(q) = mean(col);
end
bar(1:11,mean_IB2)
xticklabels(groups)
xtickangle(60)
axis([0 12 1 6])
yticklabels(answers)
ylabel('Average Response')
print(gcf,'/Users/dianaperez/Desktop/hear_imp_bias.jpg','-dpng','-r300');
yticks([1:6])
imp_bias2 = DOI(:, 12:22);
for q = 1:width(imp_bias2)
col = table2array(imp_bias2(~isnan(imp_bias2{:,q}),q));
mean_IB2(q) = mean(col);
end
bar(1:11,mean_IB2)
xticklabels(groups)
xtickangle(60)
axis([0 12 1 6])
yticks([1:6])
yticklabels(answers)
ylabel('Average Response')
print(gcf,'/Users/dianaperez/Desktop/hear_imp_bias.jpg','-dpng','-r300');
sources = DOI{:,38};
height(sources)
cell2mat(sources{1})
cell2mat(sources{4})
sources{4}
str2num(sources{4})
sources = DOI{:,38};
sources_col = [];
for s = 1:height(sources)
resp = str2num(sources{s});
sources_col = [sources_col; resp'];
end
sources = DOI{:,38};
sources_col = [];
count = 0;
for s = 1:height(sources)
resp = str2num(sources{s});
sources_col = [sources_col; resp'];
if ~isempty(resp)
count = count + 1;
end
end
max(sources_col)
for a = 1:max(sources_col)
perc = length(find(sources_col==a))/count;
end
for a = 1:max(sources_col)
perc(a) = length(find(sources_col==a))/count;
```

```
end
bar(1:11,perc)
ylabel('% responses')
print(gcf,'/Users/dianaperez/Desktop/sources_imp_bias.jpg','-dpng','-r300');
answers = {'Never', 'Once a year', 'Once/twice a quarter', 'Severla times', 'Weekly',↙
'Daily'};
exp_bias = DOI(:, 41:51);
for q = 1:width(exp_bias)
col = table2array(exp_bias(~isnan(exp_bias{:,q}),q));
mean_EB(q) = mean(col);
end
bar(1:11,mean_EB)
xticklabels(groups)
xtickangle(60)
axis([0 12 1 6])
yticks([1:6])
yticklabels(answers)
ylabel('Average Response')
print(gcf,'/Users/dianaperez/Desktop/observe_exp_bias.jpg','-dpng','-r300');
exp_bias2 = DOI(:, 54:64);
for q = 1:width(exp_bias2)
col = table2array(exp_bias2(~isnan(exp_bias2{:,q}),q));
mean_EB2(q) = mean(col);
end
bar(1:11,mean_EB2)
xticklabels(groups)
xtickangle(60)
axis([0 12 1 6])
yticks([1:6])
yticklabels(answers)
ylabel('Average Response')
print(gcf,'/Users/dianaperez/Desktop/hear_exp_bias.jpg','-dpng','-r300');
sources = DOI{:,67};
sources_col = [];
count = 0;
for s = 1:height(sources)
resp = str2num(sources{s});
sources_col = [sources_col; resp'];
if ~isempty(resp)
count = count + 1;
end
end
for a = 1:max(sources_col)
perc(a) = length(find(sources_col==a))/count;
end
bar(1:11,perc)
ylabel('% responses')
print(gcf,'/Users/dianaperez/Desktop/sources_exp_bias.jpg','-dpng','-r300');
sources = DOI{:,67};
sources_col = [];
count = 0;
for s = 1:height(sources)
resp = str2num(sources{s});
sources_col = [sources_col; resp'];
if ~isempty(resp)
count = count + 1;
end
end
perc = [];
for a = 1:max(sources_col)
```

```
perc(a) = length(find(sources_col==a))/count;
end
bar(1:11,perc)
ylabel('% responses')
contxt = DOI{:,70};
contxt_col = [];
count = 0;
for s = 1:height(contxt)
resp = str2num(contxt{s});
sources_col = [contxts_col; resp'];
if ~isempty(resp)
count = count + 1;
end
end
perc = [];
for a = 1:max(contxt_col)
perc(a) = length(find(contxt_col==a))/count;
end
bar(1:11,perc)
ylabel('% responses')
contxt = DOI{:,70};
contxt_col = [];
count = 0;
for s = 1:height(contxt)
resp = str2num(contxt{s});
sources_col = [contxt_col; resp'];
if ~isempty(resp)
count = count + 1;
end
end
perc = [];
for a = 1:max(contxt_col)
perc(a) = length(find(contxt_col==a))/count;
end
bar(1:11,perc)
ylabel('% responses')
bar(1:a,perc)
resp = str2num(contxt{1});
resp = str2num(contxt{4});
contxt = DOI{:,70};
contxt_col = [];
count = 0;
for s = 1:height(contxt)
resp = str2num(contxt{s});
contxt_col = [contxt_col; resp'];
if ~isempty(resp)
count = count + 1;
end
end
perc = [];
for a = 1:max(contxt_col)
perc(a) = length(find(contxt_col==a))/count;
end
bar(1:a,perc)
axis([0 12 0 .6])
ylabel('% responses')
print(gcf,'/Users/dianaperez/Desktop/context_bias.jpg','-dpng','-r300');
rec = DOI{:,73};
rec_col = [];
count = 0;
```

```
for s = 1:height(rec)
resp = str2num(rec{s});
rec_col = [rec_col; resp'];
if ~isempty(resp)
count = count + 1;
end
end
perc = [];
for a = 1:max(rec_col)
perc(a) = length(find(rec_col==a))/count;
end
bar(1:a,perc)
axis([0 12 0 .6])
ylabel('% responses')
axis([0 12 0 1])
print(gcf,'/Users/dianaperez/Desktop/what_can_dpt_do.jpg','-dpng','-r300');
%-- 9/1/22, 11:29 AM --%
DIC_data
imp_bias2 = DOI(:, 25:35);
for q = 1:width(imp_bias2)
col = table2array(imp_bias2(~isnan(imp_bias2{:,q}),q));
mean_IB2(q) = mean(col);
end
bar(1:11,mean_IB2)
xticklabels(groups)
xtickangle(60)
axis([0 12 1 6])
yticks([1:6])
yticklabels(answers)
ylabel('Average Response')
print(gcf,'/Users/dianaperez/Desktop/hear_imp_bias.jpg','-dpng','-r300');
sources = DOI{:,67};
sources_col = [];
count = 0;
for s = 1:height(sources)
resp = str2num(sources{s});
sources_col = [sources_col; resp'];
if ~isempty(resp)
count = count + 1;
end
end
perc = [];
for a = 1:max(sources_col)
perc(a) = length(find(sources_col==a))/count;
end
bar(1:11,perc)
ylabel('% responses')
xticklabels(sources_leg)
xtickangle(60)
sources_leg = {'grad students', 'post-docs', 'undergrads', 'faculty', 'staff', 'area↙
members', 'advisor', 'dept policies', 'dept/area culture', 'other', 'none'};
ylabel('% responses')
xticklabels(sources_leg)
xtickangle(60)
sources_leg = {'grad students', 'post-docs', 'undergrads', 'faculty', 'staff', 'area↙
members', 'advisor', 'dept policies', 'dept/area culture', 'other', 'none'};
sources = DOI{:,38};
sources_col = [];
count = 0;
for s = 1:height(sources)
```

```
resp = str2num(sources{s});
sources_col = [sources_col; resp'];
if ~isempty(resp)
count = count + 1;
end
end
for a = 1:max(sources_col)
perc(a) = length(find(sources_col==a))/count;
end
bar(1:11,perc)
ylabel('% responses')
xticklabels(sources_leg)
xtickangle(60)
print(gcf,'/Users/dianaperez/Desktop/sources_imp_bias.jpg','-dpng','-r300');
sources = DOI{:,67};
sources_col = [];
count = 0;
for s = 1:height(sources)
resp = str2num(sources{s});
sources_col = [sources_col; resp'];
if ~isempty(resp)
count = count + 1;
end
end
perc = [];
for a = 1:max(sources_col)
perc(a) = length(find(sources_col==a))/count;
end
bar(1:11,perc)
ylabel('% responses')
xticklabels(sources_leg)
xtickangle(60)
print(gcf,'/Users/dianaperez/Desktop/sources_exp_bias.jpg','-dpng','-r300');
[h, mu, sigma, q, notch] = al_goodplot(enc,[],[ 0    0.4470    0.7410],'left');
addpath '/Users/dianaperez/Documents/GitHub/PerezEtAl_HemAsymmetries/needed_files/upload'
[h, mu, sigma, q, notch] = al_goodplot(enc,[],[ 0    0.4470    0.7410],'left');
[h, mu, sigma, q, notch] = al_goodplot(enc{},[],[ 0    0.4470    0.7410],'left');
[h, mu, sigma, q, notch] = al_goodplot(enc{:,:},[],[ 0    0.4470    0.7410],'left');
enc =table2array(DOI(~isnan(DOI{:,1}), 1:11));
[h, mu, sigma, q, notch] = al_goodplot(enc,[],[ 0    0.4470    0.7410],'left');
enc1 = enc(:,1);
[h, mu, sigma, q, notch] = al_goodplot(enc1,[],[ 0    0.4470    0.7410],'left');
[h, mu, sigma, q, notch] = al_goodplot(enc1,0.1,.2,[ 0    0.4470    0.7410],'left');
[h, mu, sigma, q, notch] = al_goodplot(enc,0.1,.2,[ 0    0.4470    0.7410],'left');
[h, mu, sigma, q, notch] = al_goodplot(enc,[0.1:1:11.1],.2,[ 0    0.4470↙
0.7410],'left');
[h, mu, sigma, q, notch] = al_goodplot(enc,[0.1:1:11.1],.5,[ 0    0.4470↙
0.7410],'left');
axis([-1 12 1 6])
axis([-1 11 1 5])
groups = {'Race/Ethnicity', 'Gender', 'Sexual Orientation', 'Economic Status', 'Ability↙
Status', 'Age', 'Religion', 'Familial Obligations', 'Political Ideology',↙
'Nationality/Immigration', 'Mental Health'};
answers = {'Not at all', 'A little', 'A moderate amount', 'Quite a bit', 'A great deal'};
enc = table2array(DOI(~isnan(DOI{:,1}), 1:11));
%mean_enc = mean(table2array(enc), 1);
%bar(1:11,mean_enc)
[h, mu, sigma, q, notch] = al_goodplot(enc,[0.1:1:11.1],.5,[ 0    0.4470↙
0.7410],'bilateral');
xticklabels(groups)
```

```
[h, mu, sigma, q, notch] = al_goodplot(enc,[1:1:11],.5,[ 0    0.4470↙
0.7410],'bilateral');
xticks([1:11])
yticklabels(answers)
yticks([1:5])
xticklabels(groups)
xtickangle(60)
print(gcf,'/Users/dianaperez/Desktop/encouragement.jpg','-dpng','-r300');
al_goodplot([], 1, .5, [], 'man')
[h, mu, sigma, q, notch] = al_goodplot(enc,[1:1:11],.5,[ 0    0.4470↙
0.7410],'bilateral');
xticklabels(groups)
xtickangle(60)
axis([0 12 1 5])
yticklabels(answers)
ylabel('Average Response')
xticks([1:11])
[h, mu, sigma, q, notch] = al_goodplot(enc,[1:1:11],.5,[ 0    0.4470↙
0.7410],'bilateral');
xticks([1:11])
xticklabels(groups)
xtickangle(60)
axis([0 12 1 5])
yticks([1:5])
yticklabels(answers)
ylabel('Average Response')
axis([0 12 .5 5.5])
print(gcf,'/Users/dianaperez/Desktop/encouragement.jpg','-dpng','-r300');
answers = {'Never', 'Once a year', 'Once/twice a quarter', 'Several times', 'Weekly',↙
'Daily'};
imp_bias = DOI(:, 12:22);
for q = 1:width(imp_bias)
col(:,q) = table2array(imp_bias(~isnan(imp_bias{:,q}),q));
mean_IB(q) = mean(col(:,q));
end
for q = 1:width(imp_bias)
col = table2array(imp_bias(~isnan(imp_bias{:,q}),q));
mean_IB(q) = mean(col);
[h, mu, sigma, q, notch] = al_goodplot(col,q,.5,[ 0    0.4470    0.7410],'left');
hold on
end
xticks([1:11])
xticklabels(groups)
xtickangle(60)
axis([0 12 .5 6.5])
yticks([1:6])
DIC_data
dist(col)
figure
hist(col)
DIC_data
answers = {'Never', 'Once a year', 'Once/twice a quarter', 'Several times', 'Weekly',↙
'Daily'};
imp_bias = DOI(:, 12:22);
for q = 1:width(imp_bias)
col = table2array(imp_bias(~isnan(imp_bias{:,q}),q));
mean_IB(q) = mean(col);
[h, mu, sigma, q, notch] = al_goodplot(col,q,.2,[ 0    0.4470    0.7410],'left', .5,.↙
0011);
hold on
```

```
end
%bar(1:11,mean_IB)
xticks([1:11])
xticklabels(groups)
xtickangle(60)
axis([0 12 .5 6.5])
yticks([1:6])
yticklabels(answers)
% xticklabels(groups)
% xtickangle(60)
% axis([0 12 1 6])
% yticks([1:6])
% yticklabels(answers)
% ylabel('Average Response')
% observe explicit bias
answers = {'Never', 'Once a year', 'Once/twice a quarter', 'Severla times', 'Weekly',↙
'Daily'};
exp_bias = DOI(:, 41:51);
for q = 1:width(exp_bias)
col = table2array(exp_bias(~isnan(exp_bias{:,q}),q));
mean_EB(q) = mean(col);
[h, mu, sigma, q, notch] = al_goodplot(col,q,.2,[0.8500    0.3250    0.0980],'right', .↙
5,.0011);
end
figure
imp_bias = DOI(:, 12:22);
for q = 1:width(imp_bias)
col = table2array(imp_bias(~isnan(imp_bias{:,q}),q));
mean_IB(q) = mean(col);
[h, mu, sigma, q, notch] = al_goodplot(col,q,.3,[ 0    0.4470    0.7410],'left', .5,.↙
0011);
hold on
end
%bar(1:11,mean_IB)
xticks([1:11])
xticklabels(groups)
xtickangle(60)
axis([0 12 .5 6.5])
yticks([1:6])
yticklabels(answers)
% xticklabels(groups)
% xtickangle(60)
% axis([0 12 1 6])
% yticks([1:6])
% yticklabels(answers)
% ylabel('Average Response')
% observe explicit bias
answers = {'Never', 'Once a year', 'Once/twice a quarter', 'Severla times', 'Weekly',↙
'Daily'};
exp_bias = DOI(:, 41:51);
for q = 1:width(exp_bias)
col = table2array(exp_bias(~isnan(exp_bias{:,q}),q));
mean_EB(q) = mean(col);
[h, mu, sigma, q, notch] = al_goodplot(col,q,.3,[0.8500    0.3250    0.0980],'right', .↙
5,.0011);
end
figure
imp_bias = DOI(:, 12:22);
for q = 1:width(imp_bias)
col = table2array(imp_bias(~isnan(imp_bias{:,q}),q));
```

```
mean_IB(q) = mean(col);
[h, mu, sigma, q, notch] = al_goodplot(col,(q-.1),.3,[ 0    0.4470    0.7410],'left', .↙
5,.0011);
hold on
end
%bar(1:11,mean_IB)
xticks([1:11])
xticklabels(groups)
xtickangle(60)
axis([0 12 .5 6.5])
yticks([1:6])
yticklabels(answers)
% xticklabels(groups)
% xtickangle(60)
% axis([0 12 1 6])
% yticks([1:6])
% yticklabels(answers)
% ylabel('Average Response')
% observe explicit bias
answers = {'Never', 'Once a year', 'Once/twice a quarter', 'Severla times', 'Weekly',↙
'Daily'};
exp_bias = DOI(:, 41:51);
for q = 1:width(exp_bias)
col = table2array(exp_bias(~isnan(exp_bias{:,q}),q));
mean_EB(q) = mean(col);
[h, mu, sigma, q, notch] = al_goodplot(col,(q+.1),.3,[0.8500    0.3250↙
0.0980],'right', .5,.0011);
end
figure; imp_bias = DOI(:, 12:22);
for q = 1:width(imp_bias)
col = table2array(imp_bias(~isnan(imp_bias{:,q}),q));
mean_IB(q) = mean(col);
[h, mu, sigma, q, notch] = al_goodplot(col,(q-.01),.3,[ 0    0.4470    0.7410],'left', .↙
5,.0011);
hold on
end
%bar(1:11,mean_IB)
xticks([1:11])
xticklabels(groups)
xtickangle(60)
axis([0 12 .5 6.5])
yticks([1:6])
yticklabels(answers)
% xticklabels(groups)
% xtickangle(60)
% axis([0 12 1 6])
% yticks([1:6])
% yticklabels(answers)
% ylabel('Average Response')
% observe explicit bias
answers = {'Never', 'Once a year', 'Once/twice a quarter', 'Severla times', 'Weekly',↙
'Daily'};
exp_bias = DOI(:, 41:51);
for q = 1:width(exp_bias)
col = table2array(exp_bias(~isnan(exp_bias{:,q}),q));
mean_EB(q) = mean(col);
[h, mu, sigma, q, notch] = al_goodplot(col,(q+.01),.3,[0.8500    0.3250↙
0.0980],'right', .5,.0011);
end
figure; imp_bias = DOI(:, 12:22);
```

```
for q = 1:width(imp_bias)
col = table2array(imp_bias(~isnan(imp_bias{:,q}),q));
mean_IB(q) = mean(col);
[h, mu, sigma, q, notch] = al_goodplot(col,(q-.02),.3,[ 0    0.4470    0.7410],'left', .↙
5,.0011);
hold on
end
%bar(1:11,mean_IB)
xticks([1:11])
xticklabels(groups)
xtickangle(60)
axis([0 12 .5 6.5])
yticks([1:6])
yticklabels(answers)
% xticklabels(groups)
% xtickangle(60)
% axis([0 12 1 6])
% yticks([1:6])
% yticklabels(answers)
% ylabel('Average Response')
% observe explicit bias
answers = {'Never', 'Once a year', 'Once/twice a quarter', 'Severla times', 'Weekly',↙
'Daily'};
exp_bias = DOI(:, 41:51);
for q = 1:width(exp_bias)
col = table2array(exp_bias(~isnan(exp_bias{:,q}),q));
mean_EB(q) = mean(col);
[h, mu, sigma, q, notch] = al_goodplot(col,(q+.02),.3,[0.8500    0.3250↙
0.0980],'right', .5,.0011);
end
print(gcf,'/Users/dianaperez/Desktop/observe_imp_exp_bias.jpg','-dpng','-r300');
imp_bias2 = DOI(:, 25:35);
for q = 1:width(imp_bias2)
col = table2array(imp_bias2(~isnan(imp_bias2{:,q}),q));
mean_IB2(q) = mean(col);
[h, mu, sigma, q, notch] = al_goodplot(col,(q-.02),.3,[ 0    0.4470    0.7410],'left', .↙
5,.0011);
hold on
end
%bar(1:11,mean_IB2)
xticks([1:11])
xticklabels(groups)
xtickangle(60)
axis([0 12 .5 6.5])
yticks([1:6])
yticklabels(answers)
%print(gcf,'/Users/dianaperez/Desktop/hear_imp_bias.jpg','-dpng','-r300');
% hear of explicit bias
exp_bias2 = DOI(:, 54:64);
for q = 1:width(exp_bias2)
col = table2array(exp_bias2(~isnan(exp_bias2{:,q}),q));
mean_EB2(q) = mean(col);
[h, mu, sigma, q, notch] = al_goodplot(col,(q+.02),.3,[0.8500    0.3250↙
0.0980],'right', .5,.0011);
end
print(gcf,'/Users/dianaperez/Desktop/hear_imp_exp_bias.jpg','-dpng','-r300');
sources_leg = {'grad students', 'post-docs', 'undergrads', 'faculty', 'staff', 'area↙
members', 'advisor', 'dept policies', 'dept/area culture', 'other', 'none'};
sources = DOI{:,38};
sources_col = [];
```

```
count = 0;
for s = 1:height(sources)
resp = str2num(sources{s});
sources_col = [sources_col; resp'];
if ~isempty(resp)
count = count + 1;
end
end
perc1=[];
for a = 1:max(sources_col)
perc1(a) = length(find(sources_col==a))/count;
end
% bar(1:11,perc)
% ylabel('% responses')
% xticklabels(sources_leg)
% xtickangle(60)
% print(gcf,'/Users/dianaperez/Desktop/sources_imp_bias.jpg','-dpng','-r300');
% sources of explicit bias
sources = DOI{:,67};
sources_col = [];
count = 0;
for s = 1:height(sources)
resp = str2num(sources{s});
sources_col = [sources_col; resp'];
if ~isempty(resp)
count = count + 1;
end
end
perc2 = [];
for a = 1:max(sources_col)
perc2(a) = length(find(sources_col==a))/count;
end
bar(1:11, [perc1 perc2])
bar(1:11, [perc1; perc2])
width(50)
bar(1:11, [perc1; perc2], 'width', 50)
bar(1:11, [perc1; perc2])
h = bar(1:11, [perc1; perc2])
h.width = 1
h = bar(1:11, [perc1; perc2])
ylabel('% responses')
xticklabels(sources_leg)
xtickangle(60)
print(gcf,'/Users/dianaperez/Desktop/sources_exp_bias.jpg','-dpng','-r300');
print(gcf,'/Users/dianaperez/Desktop/sources_imp_exp_bias.jpg','-dpng','-r300');
m = findobj(gca, 'Type', 'Bar');
hleg1 = legend(m(1:2), 'Explicit Bias', 'Implicit Bias', 'Location', 'NorthEast');
print(gcf,'/Users/dianaperez/Desktop/sources_imp_exp_bias.jpg','-dpng','-r300');
%-- 9/18/22, 10:25 PM --%
fcimage_corrmat_volume↙
('/Users/dianaperez/Desktop/Research/Lifespan/datalists/lifespan_datalist_LS03.xlsx',↙
'/Volumes/fsmresfiles/PBS/Gratton_Lab/Lifespan/Post-↙
COVID/BIDS/derivatives/preproc_FCProc/', 'Seitzman300');
addpath '/Users/dianaperez/Documents/GitHub/GrattonLab-General-Repo/FCProcess'
fcimage_corrmat_volume↙
('/Users/dianaperez/Desktop/Research/Lifespan/datalists/lifespan_datalist_LS03.xlsx',↙
'/Volumes/fsmresfiles/PBS/Gratton_Lab/Lifespan/Post-↙
COVID/BIDS/derivatives/preproc_FCProc/', 'Seitzman300');
FCPROCESS_GrattonLab↙
('/Users/dianaperez/Desktop/Research/Lifespan/datalists/lifespan_datalist_LS03.xlsx',↙
```

```
'/Users/dianaperez/Desktop/', 'defaults2')
fcimage_corrmat_volume
fcimage_corrmat_volume↙
('/Users/dianaperez/Desktop/Research/Lifespan/datalists/lifespan_datalist_LS03.xlsx',↙
'/Volumes/fsmresfiles/PBS/Gratton_Lab/Lifespan/Post-↙
COVID/BIDS/derivatives/preproc_FCProc/', 'Seitzman300');
cb_vox = find(roi_data==7);
cb_vox_inds = find(roi_data==7);
cb_vox = sess_data(cb_vox_inds,:);
%-- 9/20/22, 9:01 AM --%
help nnz
%-- 10/6/22, 5:39 PM --%
data = readtable('/Users/dianaperez/Downloads/DIC_Data2022.csv');
DOI = data(:,18:90);
imp_bias = [DOI(:,12) DOI(:,13) DOI(:,15) DOI(:,16) DOI(:,21)];
groups = {'Race/Ethnicity', 'Gender', 'SES', 'Ability Status', 'Mental Health'};
answers = {'Not at all', 'A little', 'A moderate amount', 'Quite a bit', 'A great deal'};
answers = {'Never', 'Once a year', 'Once/twice a quarter', 'Several times', 'Weekly',↙
'Daily'};
imp_bias = [DOI(:,12) DOI(:,13) DOI(:,15) DOI(:,16) DOI(:,21)];
for q = 1:width(imp_bias)
col = table2array(imp_bias(~isnan(imp_bias{:,q}),q));
mean_IB(q) = mean(col);
[h, mu, sigma, q, notch] = al_goodplot(col,(q-.02),.3,[ 0    0.4470    0.7410],'left', .↙
5,.0011);
hold on
end
addpath '/Users/dianaperez/Documents/GitHub/PerezEtAl_HemAsymmetries/needed_files/upload'
imp_bias = [DOI(:,12) DOI(:,13) DOI(:,15) DOI(:,16) DOI(:,21)];
for q = 1:width(imp_bias)
col = table2array(imp_bias(~isnan(imp_bias{:,q}),q));
mean_IB(q) = mean(col);
[h, mu, sigma, q, notch] = al_goodplot(col,(q-.02),.3,[ 0    0.4470    0.7410],'left', .↙
5,.0011);
hold on
end
exp_bias = [DOI(:,25:26) DOI(:,28:29) DOI(:,35)];
for q = 1:width(exp_bias)
col = table2array(exp_bias(~isnan(exp_bias{:,q}),q));
mean_EB(q) = mean(col);
[h, mu, sigma, q, notch] = al_goodplot(col,(q+.02),.3,[0.8500    0.3250↙
0.0980],'right', .5,.0011);
end
xticklabels(groups)
xtickangle(60)
xticks([1:2:10])
xticks([1:5])
yticklabels(answers)
yticks([1:6])
ylabel('Average Response')
print(gcf,'/Users/dianaperez/Desktop/observe_imp_exp_bias_CONDENSED.jpg','-dpng','-↙
r300');
title('Experienced implicit and explicit bias')
print(gcf,'/Users/dianaperez/Desktop/observe_imp_exp_bias_CONDENSED.jpg','-dpng','-↙
r300');
for q = 1:width(imp_bias)
col = table2array(imp_bias(~isnan(imp_bias{:,q}),q));
mean_IB(q) = mean(col);
[h, mu, sigma, q, notch] = al_goodplot(col,(q-.02),.3,[ 0    0.4470    0.7410],'left', .↙
5,.0011);
```

```
hold on
end
for q = 1:width(exp_bias)
col = table2array(exp_bias(~isnan(exp_bias{:,q}),q));
mean_EB(q) = mean(col);
[h, mu, sigma, q, notch] = al_goodplot(col,(q+.02),.3,[0.8500    0.3250↙
0.0980],'right', .5,.0011);
end
xticklabels(groups)
xtickangle(60)
axis([0 12 1 6])
yticks([1:6])
yticklabels(answers)
axis([0 6 1 6])
axis([0 5 1 6])
axis([0 6 1 6])
axis([0 5.5 1 6])
axis([0.5 5.5 1 6])
xticks([1:5])
yticks([1:6])
title('How often do you hear of implicit/explicit bias?')
print(gcf,'/Users/dianaperez/Desktop/observe_imp_exp_bias_CONDENSED.jpg','-dpng','-↙
r300');
close gfc
imp_bias2 = [DOI(:,41:42) DOI(:,44:45) DOI(:,51)];
for q = 1:width(imp_bias2)
col = table2array(imp_bias2(~isnan(imp_bias2{:,q}),q));
mean_IB2(q) = mean(col);
[h, mu, sigma, q, notch] = al_goodplot(col,(q-.02),.3,[ 0    0.4470    0.7410],'left', .↙
5,.0011);
hold on
end
exp_bias2 = [DOI(:,54:55) DOI(:,57:58) DOI(:,64)];
for q = 1:width(exp_bias2)
col = table2array(exp_bias2(~isnan(exp_bias2{:,q}),q));
mean_EB2(q) = mean(col);
[h, mu, sigma, q, notch] = al_goodplot(col,(q+.02),.3,[0.8500    0.3250↙
0.0980],'right', .5,.0011);
end
for q = 1:width(imp_bias2)
col = table2array(imp_bias2(~isnan(imp_bias2{:,q}),q));
mean_IB2(q) = mean(col);
[h, mu, sigma, q, notch] = al_goodplot(col,(q-.02),.3,[ 0    0.4470    0.7410],'left', .↙
5,.0011);
hold on
end
for q = 1:width(exp_bias2)
col = table2array(exp_bias2(~isnan(exp_bias2{:,q}),q));
mean_EB2(q) = mean(col);
[h, mu, sigma, q, notch] = al_goodplot(col,(q+.02),.3,[0.8500    0.3250↙
0.0980],'right', .5,.0011);
end
xticks([1:5])
yticks([1:6])
xticklabels(groups)
xtickangle(60)
yticklabels(answers)
title('How often do you observe/experience implicit/explicit bias?')
print(gcf,'/Users/dianaperez/Desktop/observe_imp_exp_bias_CONDENSED2.jpg','-dpng','-↙
r300');
```

```
imp_bias = [DOI(:,12) DOI(:,13) DOI(:,15) DOI(:,16) DOI(:,21)];
for q = 1:width(imp_bias)
col = table2array(imp_bias(~isnan(imp_bias{:,q}),q));
mean_IB(q) = mean(col);
[h, mu, sigma, q, notch] = al_goodplot(col,(q-.02),.3,[ 0    0.4470    0.7410],'left', .↙
5,.0011);
hold on
end
exp_bias = [DOI(:,41:42) DOI(:,44:45) DOI(:,51)];%
for q = 1:width(exp_bias)
col = table2array(exp_bias(~isnan(exp_bias{:,q}),q));
mean_EB(q) = mean(col);
[h, mu, sigma, q, notch] = al_goodplot(col,(q+.02),.3,[0.8500    0.3250↙
0.0980],'right', .5,.0011);
end
imp_bias = [DOI(:,12) DOI(:,13) DOI(:,15) DOI(:,16) DOI(:,21)];
for q = 1:width(imp_bias)
col = table2array(imp_bias(~isnan(imp_bias{:,q}),q));
mean_IB(q) = mean(col);
[h, mu, sigma, q, notch] = al_goodplot(col,(q-.02),.3,[ 0    0.4470    0.7410],'left', .↙
5,.0011);
hold on
end
exp_bias = [DOI(:,41:42) DOI(:,44:45) DOI(:,51)];%
for q = 1:width(exp_bias)
col = table2array(exp_bias(~isnan(exp_bias{:,q}),q));
mean_EB(q) = mean(col);
[h, mu, sigma, q, notch] = al_goodplot(col,(q+.02),.3,[0.8500    0.3250↙
0.0980],'right', .5,.0011);
end
xticks([1:5])
xticklabels(groups)
xtickangle(60)
yticks([1:6])
yticklabels(answers)
ax = gca;
ax.FontSize = 20;
ax.FontSize = 15;
print(gcf,'/Users/dianaperez/Desktop/observe_imp_exp_bias_CONDENSED.jpg','-dpng','-r300')
imp_bias2 = [DOI(:,25:26) DOI(:,28:29) DOI(:,35)];
for q = 1:width(imp_bias2)
col = table2array(imp_bias2(~isnan(imp_bias2{:,q}),q));
mean_IB2(q) = mean(col);
[h, mu, sigma, q, notch] = al_goodplot(col,(q-.02),.3,[ 0    0.4470    0.7410],'left', .↙
5,.0011);
hold on
end
exp_bias2 = [DOI(:,54:55) DOI(:,57:58) DOI(:,64)];
for q = 1:width(exp_bias2)
col = table2array(exp_bias2(~isnan(exp_bias2{:,q}),q));
mean_EB2(q) = mean(col);
[h, mu, sigma, q, notch] = al_goodplot(col,(q+.02),.3,[0.8500    0.3250↙
0.0980],'right', .5,.0011);
end
xticks([1:5])
yticks([1:6])
xticklabels(groups)
xtickangle(60)
yticklabels(answers)
ax = gca;
```

```
ax.FontSize = 15;
print(gcf,'/Users/dianaperez/Desktop/hear_imp_exp_bias_CONDENSED.jpg','-dpng','-r300')
sources_leg = {'grad students', 'post-docs', 'undergrads', 'faculty', 'staff', 'area↙
members', 'advisor', 'dept policies', 'dept/area culture', 'other', 'none'};
sources = DOI{:,38};
sources_col = [];
count = 0;
for s = 1:height(sources)
resp = str2num(sources{s});
sources_col = [sources_col; resp'];
if ~isempty(resp)
count = count + 1;
end
end
perc1=[];
for a = 1:max(sources_col)
perc1(a) = length(find(sources_col==a))/count;
end
sources = DOI{:,67};
sources_col = [];
count = 0;
for s = 1:height(sources)
resp = str2num(sources{s});
sources_col = [sources_col; resp'];
if ~isempty(resp)
count = count + 1;
end
end
perc2 = [];
for a = 1:max(sources_col)
perc2(a) = length(find(sources_col==a))/count;
end
perc = [perc1; perc2];
avg = mean(perc,2)
avg = mean(perc,1)
sortrows(avg')
sortrows(avg', 'descend')
ind = sortrows(avg', 'descend');
[avg_sorted, ind] = sortrows(avg', 'descend');
perc1(ind)
perc1=perc1(ind);
perc2=perc2(ind);
perc = [perc1; perc2];
sources_leg{ind}
sources_leg{end} = [];
sources_leg(end) = [];
sources = DOI{:,38};
sources_col = [];
count = 0;
for s = 1:height(sources)
resp = str2num(sources{s});
sources_col = [sources_col; resp'];
if ~isempty(resp)
count = count + 1;
end
end
perc1=[];
for a = 1:max(sources_col)
perc1(a) = length(find(sources_col==a))/count;
end
```

```
sources = DOI{:,67};
sources_col = [];
count = 0;
for s = 1:height(sources)
resp = str2num(sources{s});
sources_col = [sources_col; resp'];
if ~isempty(resp)
count = count + 1;
end
end
perc2 = [];
for a = 1:max(sources_col)
perc2(a) = length(find(sources_col==a))/count;
end
perc1(end) = [];
perc2(end) = [];
avg = mean(perc,1)
[avg_sorted, ind] = sortrows(avg', 'descend');
perc1=perc1(ind);
perc = [perc1; perc2];
avg = mean(perc,1)
[avg_sorted, ind] = sortrows(avg', 'descend');
perc1=perc1(ind);
perc2=perc2(ind);
perc = [perc1; perc2];
barh(1:10, perc)
flip(perc)
flip(perc,1)
flip(perc,2)
barh(1:10, flip(perc,2))
xlabel('% responses')
yticklabels(sources_leg{ind})
sources_leg_sorted = sources_leg{ind};
yticklabels(sources_leg_sorted)
yticks(1:10)
yticklabels(sources_leg_sorted)
sources_leg{ind}
sources_leg_sorted = {'faculty', 'other', 'grad students', 'advisor', 'dept policies',↙
'undergrads', 'area members', 'post-docs', 'dept/area culture', 'staff'};
yticklabels(sources_leg_sorted)
sources_leg_sorted = {'staff', 'dept/area culture', 'post-docs', 'area members',↙
'undergrads', 'dept policies', 'advisor', 'grad students', 'other', 'faculty'};
yticklabels(sources_leg_sorted)
ax = gca;
ax.FontSize = 14;
barh(1:10, perc, .7)
barh(1:10, perc, 1.2)
barh(1:10, perc, 1)
barh(1:10, flip(perc,2), 1)
xlabel('% responses')
yticklabels(sources_leg_sorted)
ax.FontSize = 14;
print(gcf,'/Users/dianaperez/Desktop/sources_exp_imp_bias_horizontal.jpg','-dpng','-↙
r300')
bar(1:10, perc)
bar(1:10, perc, 1)
ylabel('% responses')
xticklabels(sources_leg_sorted)
xticklabels(flip(sources_leg_sorted))
xtickangle(60)
```

```
ax.FontSize = 14;
print(gcf,'/Users/dianaperez/Desktop/sources_exp_imp_bias.jpg','-dpng','-r300')
rec = DOI{:,73};
rec_col = [];
count = 0;
for s = 1:height(rec)
resp = str2num(rec{s});
rec_col = [rec_col; resp'];
if ~isempty(resp)
count = count + 1;
end
end
perc = [];
for a = 1:max(rec_col)
perc(a) = length(find(rec_col==a))/count;
end
[recs_sorted, ind] = sortrows(perc', 'descend');
%-- 10/11/22, 5:15 PM --%
load_nii_wrapper
addpath '/Users/dianaperez/Documents/GitHub/GrattonLab-General-Repo/FCProcess'
uiopen('/Users/dianaperez/Desktop/tpl-MNI152NLin2009cAsym_res-01_desc-↙
BrainCerebellumExtraction_mask.nii.gz',1)
load_nii_wrapper('/Users/dianaperez/Desktop/tpl-MNI152NLin2009cAsym_res-01_desc-↙
BrainCerebellumExtraction_mask.nii.gz')
cd '/Users/dianaperez/Documents/GitHub/GrattonLab-General-Repo/FCProcess'
load_nii_wrapper('/Users/dianaperez/Desktop/tpl-MNI152NLin2009cAsym_res-01_desc-↙
BrainCerebellumExtraction_mask.nii.gz')
load_nii_wrapper('/Users/dianaperez/Desktop/tpl-MNI152NLin2009cAsym_res-01_desc-↙
BrainCerebellumExtraction_mask.nii.gz');
load_nii_wrapper('/Users/dianaperez/Downloads/tpl-MNI152NLin2009cAsym_res-01_desc-↙
carpet_dseg.nii.gz');
nifti = ans;
unique(nifti)
uiopen('/Volumes/fsmresfiles/PBS/Gratton_Lab/Lifespan/Post-↙
COVID/BIDS/derivatives/preproc_fmriprep-20.2.0/fmriprep/sub-LS03/ses-1/func/sub-LS03_ses-↙
1_task-rest_run-1_space-MNI152NLin6Asym_res-2_desc-brain_mask.nii.gz',1)
load_nii_wrapper('/Users/dianaperez/Desktop/Bucker_CBmask_resampled.nii.gz')
load_nii_wrapper('/Users/dianaperez/Desktop/Buckner_CBmask_resampled.nii.gz')
load_nii_wrapper('/Users/dianaperez/Desktop/Buckner_CBmask_resampled.nii.gz');
buck_mask = ans;
unique(buck_mask)
new_mask = zeros(buck_mask);
new_mask = logical(buck_mask);
unique(new_mask)
help save_nii
save_nii(new_mask, '/Users/dianaperez/Desktop/Buckner_CBmask_resampled_binary.nii.gz')
new_mask = single(logical(buck_mask));
save_nii(new_mask, '/Users/dianaperez/Desktop/Buckner_CBmask_resampled_binary.nii.gz')
%-- 10/12/22, 12:57 PM --%
atlas = 'Seitzman300';
FCdir = '/Users/dianaperez/Desktop/preprofc_FCProc';
outDir_top = [FCdir '/corrmats_' atlas '/'];
if ~exist(outDir_top)
mkdir(outDir_top);
end
clear all
fcimage_corrmat_volume('/Users/dianaperez/Desktop/preprofc_FCProc/lifespan_datalist_LS03.↙
xlsx', '/Users/dianaperez/Desktop/preprofc_FCProc/', 'Seitzman300')
addpath '/Users/dianaperez/Documents/GitHub/GrattonLab-General-Repo/FCProcess'
fcimage_corrmat_volume('/Users/dianaperez/Desktop/preprofc_FCProc/lifespan_datalist_LS03.↙
```

```
xlsx', '/Users/dianaperez/Desktop/preprofc_FCProc/', 'Seitzman300')
addpath '/Users/dianaperez/Documents/GitHub/Lifespan-Analysis'
fcimage_corrmat_volume('/Users/dianaperez/Desktop/preprofc_FCProc/lifespan_datalist_LS03.↙
xlsx', '/Users/dianaperez/Desktop/preprofc_FCProc/', 'Seitzman300')
length(find(sess_roi_timeseries_concat(:,1)~=0))
unique(roi_data)
length(find(atlas_params.mods_array==7))
length(find(roi_data==7))
fcimage_corrmat_volume('/Users/dianaperez/Desktop/preprofc_FCProc/lifespan_datalist_LS03.↙
xlsx', '/Users/dianaperez/Desktop/preprofc_FCProc/', 'Seitzman300')
atlas_params = atlas_parameters_GrattonLab(atlas,atlas_dir);
atlas = 'Seitzman300';
atlas_params = atlas_parameters_GrattonLab(atlas,atlas_dir);
atlas_dir = '/Volumes/fsmresfiles/PBS/Gratton_Lab/Atlases/';
atlas_params = atlas_parameters_GrattonLab(atlas,atlas_dir);
unique(atlas_params.mods_array)
fcimage_corrmat_volume
fcimage_corrmat_volume('/Users/dianaperez/Desktop/preprofc_FCProc/lifespan_datalist_LS03.↙
xlsx', '/Users/dianaperez/Desktop/preprofc_FCProc/', 'Seitzman300')
only_cb = sess_data(sess_data(:,1)~=0,:);
tmaskFile = sprintf('%s/sub-%s/ses-%d/func/FD_outputs/sub-%s_ses-%d_task-%s_run-%d_desc-↙
tmask_%s.txt',...
FCdir,subInfo(i).subjectID,subInfo(i).session,...
subInfo(i).subjectID,subInfo(i).session,subInfo(i).condition,subInfo(i).runs(j),subInfo↙
(i).FDtype);
tmask{j} = table2array(readtable(tmaskFile));
tmask_concat = [tmask_concat; tmask{j}];
fcimage_corrmat_volume('/Users/dianaperez/Desktop/preprofc_FCProc/lifespan_datalist_LS03.↙
xlsx', '/Users/dianaperez/Desktop/preprofc_FCProc/', 'Seitzman300')
fcimage_corrmat_volume_only_cbvox↙
('/Users/dianaperez/Desktop/preprofc_FCProc/lifespan_datalist_LS03.xlsx',↙
'/Users/dianaperez/Desktop/preprofc_FCProc/', 'Seitzman300')
h = figure('Color',[0.8275 0.8275 0.8275],'Position',[56 143 1295 807]);
imagesc(corrmat)
load better_jet_colormap.mat; % assume this is in the same folder
colormap(better_jet_colormap_diff);
colorbar
fcimage_corrmat_volume_only_cbvox
fcimage_corrmat_volume_only_cbvox↙
('/Users/dianaperez/Desktop/preprofc_FCProc/lifespan_datalist_LS03.xlsx',↙
'/Users/dianaperez/Desktop/preprofc_FCProc/', 'Seitzman300')
nrois = [274:300];
nrois(nr)
fcimage_corrmat_volume_only_cbvox
fcimage_corrmat_volume_only_cbvox↙
('/Users/dianaperez/Desktop/preprofc_FCProc/lifespan_datalist_LS03.xlsx',↙
'/Users/dianaperez/Desktop/preprofc_FCProc/', 'Seitzman300')
h = figure('Color',[0.8275 0.8275 0.8275],'Position',[56 143 1295 807]); %[56 143 1095↙
807]
imagesc(matrix_orig)
load better_jet_colormap.mat; % assume this is in the same folder
colormap(better_jet_colormap_diff);
colorbar;
axis square;
fcimage_corrmat_volume_only_cbvox↙
('/Users/dianaperez/Desktop/preprofc_FCProc/lifespan_datalist_LS03.xlsx',↙
'/Users/dianaperez/Desktop/preprofc_FCProc/', 'Seitzman300')
fcimage_corrmat_volume_only_cbvox↙
('/Users/dianaperez/Desktop/preprofc_FCProc/lifespan_datalist_LS03.xlsx',↙
'/Volumes/fsmresfiles/PBS/Gratton_Lab/Lifespan/Post-↙
```

```
COVID/BIDS/derivatives/preproc_FCProc/', 'Seitzman300')
%-- 10/18/22, 5:09 PM --%
fcimage_corrmat_volume_only_cbvox↙
('/Users/dianaperez/Desktop/preprofc_FCProc/lifespan_datalist_LS03.xlsx',↙
'/Users/dianaperez/Desktop/preprofc_FCProc/norm_preproc/', 'Seitzman300')
addpath '/Users/dianaperez/Documents/GitHub/GrattonLab-General-Repo/FCProcess'
fcimage_corrmat_volume_only_cbvox↙
('/Users/dianaperez/Desktop/preprofc_FCProc/lifespan_datalist_LS03.xlsx',↙
'/Users/dianaperez/Desktop/preprofc_FCProc/norm_preproc/', 'Seitzman300')
addpath '/Users/dianaperez/Documents/GitHub/GrattonLab-General-Repo/FCProcess'
fcimage_corrmat_volume_only_cbvox↙
('/Users/dianaperez/Desktop/preprofc_FCProc/lifespan_datalist_LS03.xlsx',↙
'/Users/dianaperez/Desktop/preprofc_FCProc/norm_preproc/', 'Seitzman300')
addpath '/Users/dianaperez/Documents/GitHub/Lifespan-Analysis'
fcimage_corrmat_volume_only_cbvox↙
('/Users/dianaperez/Desktop/preprofc_FCProc/lifespan_datalist_LS03.xlsx',↙
'/Users/dianaperez/Desktop/preprofc_FCProc/norm_preproc/', 'Seitzman300')
reliabilty_cbdata
plot(times_all, corr(1,:), 'Color', [1,0.5,0], 'LineWidth', 3)
hold on
dataDir = '/Users/dianaperez/Desktop/preprofc_FCProc/norm_preproc/corrmats_Seitzman300/';
for s = 1:numel(subject)
catData = [];
catTmask = [];
for i = 1:sessions
%load mat file
load([dataDir 'sub-' subject{s} '/sub-' subject{s} '_sess-' num2str(i) '_task-↙
rest_corrmat_Seitzman300.mat'])
masked_data = sess_roi_timeseries_concat(:,logical(tmask_concat'));
%         catData = [catData masked_data];
catData = [catData masked_data];
catTmask = [catTmask tmask_concat'];
end
%I think this should be 10,816
disp(sprintf('Total number of sample points for subject %s is %d by %d...', subject{s},↙
size(catData,1), size(catData,2)))
%true-half is 150min=8181 samp points (TR = 1.1; (8181*1.1)/60=149.99)
truehalf = catData(:,1:pts2sample);
corrmat_truehalf = paircorr_mod(truehalf');
fout_truehalf = sprintf('%s/sub-%s_truehalf_100min_corrmat_reliabilityanalysis',↙
output_dir, subject{s});
%figure_corrmat_GrattonLab(corrmat_truehalf,atlas_params,-1,1);
%saveas(gcf,[fout_truehalf '.tiff'],'tiff');
%close(gcf);
maskmat = ones(size(corrmat_truehalf, 1));
maskmat = logical(triu(maskmat, 1));
truehalf_corrlin(1,:) = corrmat_truehalf(maskmat);
times = floor((size(catData,2)-pts2sample)/sampstep);
times = [5:5:(times*5)];
%sample data
for t = 1:numel(times)
sampledDatas{t} = catData(:, (pts2sample+1):(pts2sample+(sampstep*t)));
corrmat = paircorr_mod(sampledDatas{t}');
fout = sprintf('%s/sub-%s_sampled_%dmin_corrmat_reliabilityanalysis', output_dir, subject↙
{s}, times(t));
%figure_corrmat_GrattonLab(corrmat,atlas_params,-1,1);
%saveas(gcf,[fout '.tiff'],'tiff');
%close(gcf);
corrs{t} = paircorr_mod(triu(corrmat_truehalf), triu(corrmat));
corrlins(t,:) = corrmat(maskmat);
```

```
end
sampledDatas{t+1} = catData(:, (pts2sample+1):end);
corrmat = paircorr_mod(sampledDatas{t+1}');
corrs{t+1} = paircorr_mod(triu(corrmat_truehalf), triu(corrmat));
corrlins((t+1),:) = corrmat(maskmat);
times = [5:5:((numel(times)+1)*5)];
for j = 1:size(corrlins,1)
tmpcorr = corrcoef(truehalf_corrlin', corrlins(j,:)', 'rows', 'complete');
corr(s,j) = tmpcorr(2,1);
clear tmpcorr
end
times_all(s,1:size(times,2)) = times;
clear times
clear catData
clear catTmask
clear corrlins
clear corrmat
clear corrmat_truehalf
clear corrs
clear masked_data
clear sampledDatas
clear tmask
clear tmask_concat
clear truehalf
clear truehalf_corrlin
clear sess_roi_timeseries
clear sess_roi_timeseries_concat
end
plot(times_all ,corr(1,:),'Color',[0, 0, 1],'LineWidth', 3)
m = findobj(gca,'Type','line');
hleg1 = legend(m(1:2), 'normal gsr', 'cb gsr', 'Location', 'SouthEast');
print(gcf,[output_dir '/Reliability_cb-gsr.jpg'],'-dpng','-r300');
print(gcf,'/Users/dianaperez/Desktop/preprofc_FCProc//Reliability_cb-gsr.jpg','-dpng','-↙
r300');
%-- 10/31/22, 4:44 PM --%
system('pwsh')
system('pwd')
system('~/')
system('cd ~/')
system('pwd')
system('cd ~/Users/dianaperez')
system('cd ..')
system('pwd')
cd /Users/dianaperez
system('pwsh')
system('pwd')
[a, b] = system('pwsh')
[a, b] = system('/usr/local/bin/pwsh')
%-- 10/31/22, 5:07 PM --%
[a, b] = system('/usr/local/bin/pwsh help')
[a, b] = system('/usr/local/bin/pwsh -Login')
%-- 11/28/22, 7:13 AM --%
similarity_analysis_wLongitudinal
%-- 2/1/23, 12:20 AM --%
cdmscale_lifespan
similarity_analysis_forced_same_amt_data
addpath '/Users/dianaperez/Documents/GitHub/General_Scripts'
cdmscale_lifespan
addpath '/Users/dianaperez/Documents/GitHub/Lifespan-Analysis'
cdmscale_lifespan
```

```
axes([-15 30 -15 15])
axis([-15 30 -15 15])
axis([-15 30 -15 25])
cdmscale_lifespan
%-- 2/3/23, 10:57 AM --%
cdmscale_lifespan
addpath '/Users/dianaperez/Documents/GitHub/Lifespan-Analysis'
cdmscale_lifespan
vline_new(atlas_params.transitions,'k',3);
hline_new(atlas_params.transitions,'k',3);
tickpos = atlas_params.centers;
ax = axis;
%-- 2/3/23, 3:01 PM --%
cdmscale_lifespan
addpath '/Users/dianaperez/Documents/GitHub/GrattonLab-General-Repo/FCProcess'
cdmscale_lifespan
addpath '/Users/dianaperez/Documents/GitHub/Lifespan-Analysis'
cdmscale_lifespan
[Y E] = cmdscale_mat_MSC(input,groups,'euclidean',colors,subs)
figure
[Y E] = cmdscale_mat_MSC(input,groups,'correlation',colors,subs)
help pdist
[Y E] = cmdscale_mat_MSC(input,groups,'correlation',colors,subs)
figure
imagesc(mat_col')
clear all
cdmscale_lifespan
figure
imagesc(mat_col')
axis([-10 30 -20 25])
figure;
[Y E] = cmdscale_mat_MSC(input,groups,'correlation',colors,subs)
D = pdist(double(mat_col'),dist_type);
axis([-.4 .6 -.4 .4])
cdmscale_lifespan
axis([-.4 .6 -.4 .4])
axis([-10 30 -20 25])
axis([-5 30 -20 25])
axis([-20 30 -20 25])
axis([-15 30 -20 25])
axis([-15 40 -20 25])
axis([-15 45 -20 25])
cdmscale_lifespan
sum(allSubs_amtData,1)
sum(allSubs_amtData,2)
min(total_data)
total_data = sum(allSubs_amtData,2);
smallest_amt = min(total_data);
split_half = floor(smallest_amt/2);
cdmscale_lifespan_splitses
size(masked_data,2)
cdmscale_lifespan_splitses
total_data = sum(allSubs_amtData,1);
smallest_amt = min(total_data);
amt_data = floor(smallest_amt/2);
size(masked_data,2)
size(masked_data,2)-amt_data
matched_data_2 = masked_data(:,(size(masked_data,2)-amt_data):end);
matched_data_2 = masked_data(:,(size(masked_data,2)-amt_data+1):end);
cdmscale_lifespan_splitses
```

```
cdmscale_lifespan
%-- 2/13/23, 5:44 PM --%
load('/Users/dianaperez/Desktop/FC_Parcels_333/sub-LS02_rest_ses-1_parcel_timecourse.↙
mat')
reliability_analysis_G333
maskmat = ones(333);
maskmat = logical(triu(maskmat, 1));
truehalf_corrlin(1,:) = corrmat_truehalf(maskmat);
reliability_analysis_G333
axis([0 1 0 100])
axis([0 100 0 1])
plot(times_all(1,1:48),mean(1:48), ':', 'Color', [0,0,0], 'LineWidth',3) %average
mean(means{1:8})
reliability_analysis_G333
means = [0.558299   0.655694765 0.707371651 0.73979493  0.762946177 0.779178405↙
0.790522018 0.802113188 0.812064613 0.820295988 0.827574146 0.833868939 0.839342416↙
0.843669992 0.84802989  0.852440158 0.855737711 0.8592886   0.861987349 0.864990617↙
0.867766204 0.870012403 0.871921675 0.874183608 0.876164527 0.871685358 0.873252072↙
0.875060784 0.876514917 0.877787231 0.905295217 0.906622921 0.90778087  0.908984651↙
0.910107888 0.910929481 0.912091361 0.912735012 0.913586008 0.914280476 0.910357217↙
0.911032658 0.911704121 0.91238943  0.913110063 0.913701016 0.914340857 0.914802561↙
0.915357006 0.915758258 0.918267278];
reliability_analysis_G333
%-- 2/15/23, 12:36 PM --%
load('/Volumes/fsmresfiles/PBS/Gratton_Lab/Lifespan/Post-↙
COVID/BIDS/derivatives/postFCproc_CIFTI/FC_Parcels_333/sub-INET001_rest_ses-↙
1_parcel_timecourse.mat')
similarity_analysis_forced_same_amt_data
parcel_time'(:,logical(tmask_concat))
parcel_time(:,logical(tmask_concat))';
parcel_time(logical(tmask_concat),:)';
similarity_analysis_forced_same_amt_data
amt_data = min(min(allSubs_amtData));
similarity_analysis_forced_same_amt_data
amt_data = min(allSubs_amtData);
similarity_analysis_forced_same_amt_data
addpath '/Users/dianaperez/Documents/GitHub/General_Scripts'
similarity_analysis_forced_same_amt_data
figure('Position',[1 1 1000 800]);
imagesc(simmat,[0 1]); colormap('jet');
hline_new([0,4,8,12,16,20,24,28,32,36,40]+0.5,'k',2);
vline_new([0,4,8,12,16,20,24,28,32,36,40]+0.5,'k',2);
set(gca,'XTick',[2,6,10,14,18,22,26,30,34,38], 'YTick', [2,6,10,14,18,22,26,30,34,38],↙
'XTickLabel',...
{'INET001','INET002',↙
'INET003','INET005','INET006','INET010','INET016','INET018','INET019','INET030'},↙
'YTickLabel', {'LS02', 'LS03', 'LS05', 'LS08', 'LS11', 'LS14','LS16','LS17'});
set(gca,'XTick',[2,6,10,14,18,22,26,30,34,38]+0.5, 'YTick', [2,6,10,14,18,22,26,30,34,38]↙
+0.5, 'XTickLabel',...
{'INET001','INET002',↙
'INET003','INET005','INET006','INET010','INET016','INET018','INET019','INET030'},↙
'YTickLabel', {'LS02', 'LS03', 'LS05', 'LS08', 'LS11', 'LS14','LS16','LS17'});
hline_new([0,4,8,12,16,20,24,28,32,36,40]+0.5,'k',2);
vline_new([0,4,8,12,16,20,24,28,32,36,40]+0.5,'k',2);
set(gca,'XTick',[2,6,10,14,18,22,26,30,34,38]+0.5, 'YTick', [2,6,10,14,18,22,26,30,34,38]↙
+0.5, 'XTickLabel',...
{'INET001','INET002',↙
'INET003','INET005','INET006','INET010','INET016','INET018','INET019','INET030'},↙
'YTickLabel', {'INET001','INET002',↙
'INET003','INET005','INET006','INET010','INET016','INET018','INET019','INET030'});
```

```
axis square;
colorbar;
title('Correlation Matrix Similarity');
if match_data
saveas(gcf,[outDir data_set '_' data_type '_similarityMat_matchedData_' num2str(amt_data)↙
'.tiff'],'tiff');
else
saveas(gcf,[outDir data_set '_' data_type '_similarityMat.tiff'],'tiff');
end
similarity_analysis_forced_same_amt_data
hline_new([0,4,8,12,16,20,24,28,32,36,40]+0.5,'k',2);
vline_new([0,4,8,12,16,20,24,28,32,36,40]+0.5,'k',2);
set(gca,'XTick',[2,6,10,14,18,22,26,30,34,38]+0.5, 'YTick', [2,6,10,14,18,22,26,30,34,38]↙
+0.5, 'XTickLabel',...
{'INET001','INET002',↙
'INET003','INET005','INET006','INET010','INET016','INET018','INET019','INET030'},↙
'YTickLabel', {'INET001','INET002',↙
'INET003','INET005','INET006','INET010','INET016','INET018','INET019','INET030'});
axis square;
colorbar;
title('Correlation Matrix Similarity');
if match_data
saveas(gcf,[outDir data_set '_' data_type '_similarityMat_matchedData_' num2str(amt_data)↙
'.tiff'],'tiff');
else
saveas(gcf,[outDir data_set '_' data_type '_similarityMat.tiff'],'tiff');
end
close('all');
count = 1;
within = [];
between = [];
for s = 1:numel(subject)
lines = [count:(count+sessions-1)];
sub_vals = simmat(lines,:);
maskmat = ones(sessions,sessions);
maskmat = logical(triu(maskmat, 1));
within_sub = sub_vals(:,lines);
within = [within; within_sub(maskmat)];
maskmat = ones(size(sub_vals));
maskmat(:,lines) = 0;
between = [between; sub_vals(maskmat==1)];
count = count+sessions;
end
mean(between)
mean(within)
similarity_analysis_forced_same_amt_data
dataDir = '/Volumes/fsmresfiles/PBS/Gratton_Lab/Lifespan/Post-↙
COVID/derivatives/preproc_FCProc/corrmats_Seitzman300/';
cd dataDir
cd /Volumes/fsmresfiles/PBS/Gratton_Lab/Lifespan/Post-COVID/
dataDir = '/Volumes/fsmresfiles/PBS/Gratton_Lab/Lifespan/Post-↙
COVID/BIDS/derivatives/preproc_FCProc/corrmats_Seitzman300/';
cd dataDir
pwd
dataDir = '/Volumes/fsmresfiles/PBS/Gratton_Lab/Lifespan/Post-↙
COVID/BIDS/derivatives/preproc_FCProc/corrmats_Seitzman300';
cd dataDir = '/Volumes/fsmresfiles/PBS/Gratton_Lab/Lifespan/Post-↙
COVID/BIDS/derivatives/preproc_FCProc/corrmats_Seitzman300';
cd dataDir
dataDir = '/Volumes/fsmresfiles/PBS/Gratton_Lab/Lifespan/Post-↙
```

```
COVID/BIDS/derivatives/preproc_FCProc/corrmats_Seitzman300/';
similarity_analysis_forced_same_amt_data
tick_marks = [0:5:(5*numel(LS_subject))]+0.5;
tick_marks+(sessions/2)
tick_marks(1:numel(subject))+(sessions/2)
figure('Position',[1 1 1000 800]);
imagesc(simmat,[0 1]); colormap('jet');
tick_marks = [0:sessions:(5*numel(subject))]+0.5;
hline_new(tick_marks,'k',2);
vline_new(tick_marks,'k',2);
set(gca,'XTick',tick_marks(1:numel(subject))+(sessions/2), 'YTick', tick_marks(1:numel↙
(subject))+(sessions/2), 'XTickLabel',...
subject, 'YTickLabel', subject);
similarity_analysis_forced_same_amt_data
cd /Users/dianaperez/Documents/GitHub/Lifespan-Analysis/
load('Lifespan_reliability_data_for_plot.mat')
clear all
cd /Users/dianaperez/Documents/GitHub/Lifespan-Analysis/
load('Lifespan_reliability_data_for_plot.mat')
addpath '/Users/dianaperez/Desktop'
load('Lifespan_reliability_data_for_plot.mat')
for s = 1:numel(subject)
plot(times_all(s,1:size(means{1,s},2)),means{1,s},'Color',rgb_colors(s,:),'LineWidth', 3)
hold on
end
subject = {'LS02', 'LS03', 'LS05', 'LS08', 'LS11', 'LS14', 'LS16', 'LS17'};
sessions = 5;
for s = 1:numel(subject)
plot(times_all(s,1:size(means{1,s},2)),means{1,s},'Color',rgb_colors(s,:),'LineWidth', 3)
hold on
end
for t = 1:48
tmp = [];
for s = 1:numel(subject)
if t <= size(means{1,s},2)
tmp = [tmp;means{1,s}(t)]
else
continue;
end
end
mean_of_means(t) = mean(tmp);
end
plot(times_all(1,1:48),mean_of_means(1:48), ':', 'Color', [0,0,0], 'LineWidth',3) %↙
average
ylabel('Pearson Correlation (r)');
xlabel('Time (Minutes)');
m = findobj(gca,'Type','line');
hleg1 = legend(m(1:9), 'Mean', 'LS17', 'LS16', 'LS14', 'LS11', 'LS08', 'LS05', 'LS03',↙
'LS02', 'Location', 'SouthEast');
hleg1.FontSize = 20;
ax = gca;
ax.FontSize = 24;
output_dir = '/Users/dianaperez/Desktop/';
print(gcf,[output_dir 'Lifespan_Reliability_truehalf_' num2str(pts2sample) '.jpg'],'-↙
dpng','-r300');
pts2sample = 3808;
print(gcf,[output_dir 'Lifespan_Reliability_truehalf_' num2str(pts2sample) '.jpg'],'-↙
dpng','-r300');
dmat_file = '/Users/dianaperez/Documents/Dependencies/Resources/Conte69_atlas-v2.LR.↙
32k_fs_LR.wb/Cifti_geo_distances_xhemisphere_large.mat'
```

```
dmat = smartload(dmat_file);
clear all
dmat = smartload(dmat_file);
dmat_file = '/Users/dianaperez/Documents/Dependencies/Resources/Conte69_atlas-v2.LR.↙
32k_fs_LR.wb/Cifti_geo_distances_xhemisphere_large.mat'
dmat = smartload(dmat_file);
%-- 2/17/23, 2:19 PM --%
gifti_read('/Volumes/fsmresfiles/PBS/GrattonLab/Lifespan/Pre-↙
COVID/Nifti/derivatives/freesurfer-6.0.1/FREESURFER_fs_LR/sub-↙
LS02/NativeVol/fsaverage_LR32k/sub-LS02.R.midthickness.32k_fs_LR.surf.gii')
gifti_read('/Volumes/fsmresfiles/PBS/Gratton_Lab/Lifespan/Pre-↙
COVID/Nifti/derivatives/freesurfer-6.0.1/FREESURFER_fs_LR/sub-↙
LS02/NativeVol/fsaverage_LR32k/sub-LS02.R.midthickness.32k_fs_LR.surf.gii')
gifti_read('/Volumes/fsmresfiles/PBS/Gratton_Lab/Lifespan/Pre-↙
COVID/BIDS/Nifti/derivatives/freesurfer-6.0.1/FREESURFER_fs_LR/sub-↙
LS02/NativeVol/fsaverage_LR32k/sub-LS02.R.midthickness.32k_fs_LR.surf.gii')
gifti_read('/Volumes/fsmresfiles/PBS/Gratton_Lab/Lifespan/Pre-↙
COVID/BIDS/Nifti/derivatives/freesurfer-6.0.1/FREESURFER_fs_LR/sub-↙
LS02/NativeVol/fsaverage_LR32k/sub-LS02.R.midthickness.32k_fs_LR.surf.gii', this)
this.data = [];
this.metaData = [];
this.label = [];
gifti_read('/Volumes/fsmresfiles/PBS/Gratton_Lab/Lifespan/Pre-↙
COVID/BIDS/Nifti/derivatives/freesurfer-6.0.1/FREESURFER_fs_LR/sub-↙
LS02/NativeVol/fsaverage_LR32k/sub-LS02.R.midthickness.32k_fs_LR.surf.gii', this)
cd /Users/dianaperez/Applications/
cd ~/Applications/workbench
cd /Applications/workbench
wb_path = '/Applications/workbench/bin_macosx64/';
right_surface = '/Volumes/fsmresfiles/PBS/GrattonLab/Lifespan/Pre-↙
COVID/Nifti/derivatives/freesurfer-6.0.1/FREESURFER_fs_LR/sub-↙
LS02/NativeVol/fsaverage_LR32k/sub-LS02.R.midthickness.32k_fs_LR.surf.gii';
vertex = 1;
system([wb_path ' wb_command -surface-geodesic-distance ' surface ' ' num2str(vertex) ' '↙
output_fname])
output = [];
system([wb_path ' wb_command -surface-geodesic-distance ' surface ' ' num2str(vertex) ' '↙
output_fname])
system([wb_path ' wb_command -surface-geodesic-distance ' surface ' ' num2str(vertex) ' '↙
output])
output = '/Users/dianaperez/Desktop/testing_output_dist';
system([wb_path ' wb_command -surface-geodesic-distance ' surface ' ' num2str(vertex) ' '↙
output])
[x y] = system([wb_path ' wb_command -surface-geodesic-distance ' surface ' ' num2str↙
(vertex) ' ' output])
[x y] = system([wb_path ' wb_command -surface-geodesic-distance ' surface ' ' num2str↙
(vertex) ' ' output_f])
[x y] = system([wb_path ' wb_command -surface-geodesic-distance ' surface ' ' num2str↙
(vertex) ' ' output_fname])
output_fname = {};
[x y] = system([wb_path ' wb_command -surface-geodesic-distance ' surface ' ' num2str↙
(vertex) ' ' output_fname])
[x y] = system([wb_path ' wb_command -surface-geodesic-distance-all-to-all ' surface ' '↙
output '.dtseries.nii'])
[x y] = system([wb_path ' wb_command -surface-geodesic-distance-all-to-all ' surface ' '↙
output ])
system([wb_path ' wb_command -surface-geodesic-distance-all-to-all ' surface ' '↙
output_fname])
system([wb_path ' wb_command -surface-geodesic-distance-all-to-all ' surface ' '↙
output_fname]);
```

```
system([wb_path 'wb_command -surface-geodesic-distance-all-to-all ' surface ' sub-↙
LS02_distances_right.dconn.nii'])
system('/Applications/workbench/bin_macosx64/wb_command -surface-geodesic-distance-all-↙
to-all /Volumes/fsmresfiles/PBS/GrattonLab/Lifespan/Pre-↙
COVID/Nifti/derivatives/freesurfer-6.0.1/FREESURFER_fs_LR/sub-↙
LS02/NativeVol/fsaverage_LR32k/sub-LS02.R.midthickness.32k_fs_LR.surf.gii sub-↙
LS02_distances_right.dconn.nii')
right_surface = '/Volumes/fsmresfiles/PBS/Gratton_Lab/Lifespan/Pre-↙
COVID/BIDS/Nifti/derivatives/freesurfer-6.0.1/FREESURFER_fs_LR/sub-↙
LS02/NativeVol/fsaverage_LR32k/sub-LS02.R.midthickness.32k_fs_LR.surf.gii';
command = [wb_path 'wb_command -surface-geodesic-distance-all-to-all ' right_surface '↙
sub-LS02_distances_right.dconn.nii'];
command
system(command)
command = [wb_path 'wb_command -surface-geodesic-distance-all-to-all ' right_surface '↙
/Users/dianaperez/Desktop/sub-LS02_distances_right.dconn.nii'];
system(command)
test = ft_read_cifti_mod('/Users/dianaperez/Desktop/sub-LS02_distances_right.dconn.nii')
cd /Users/dianaperez/Documents/
test = ft_read_cifti_mod('/Users/dianaperez/Desktop/sub-LS02_distances_right.dconn.nii')
right_surface = '/Volumes/fsmresfiles/PBS/Gratton_Lab/Lifespan/Pre-↙
COVID/BIDS/Nifti/derivatives/freesurfer-6.0.1/FREESURFER_fs_LR/sub-↙
LS02/NativeVol/fsaverage_LR32k/sub-LS02.L.midthickness.32k_fs_LR.surf.gii';
command = [wb_path 'wb_command -surface-geodesic-distance-all-to-all ' right_surface '↙
/Users/dianaperez/Desktop/sub-LS02_distances_left.dconn.nii'];
system(command)
%-- 2/22/23, 12:36 PM --%
test = ft_read_cifti_mod('/Users/dianaperez/Desktop/sub-LS02_distances_right.dconn.nii')
network_seg_new
cd(atlasdir)
network_seg_new
rois = atlas_params.mods{net};
network_seg_new
cd /Users/dianaperez/Documents/GitHub/Lifespan-Analysis/
within_sub_reliability_v2
data = parcel_time';
masked_data = data(:,logical(tmask_concat));
within_sub_reliability_v2
size(atlas_params.networks)
length(atlas_params.networks)
within_sub_reliability_v2
figure;
for s = 1:numel(subject)
plot(times_all(s,1:size(allsubs_seg_ind{s},2)),mean(allsubs_abs_diffs{1,s}(:,1:size↙
(allsubs_seg_ind{s},2)),1),'LineWidth', 3)
hold on
means_diff{s} = mean(allsubs_abs_diffs{1,s}(:,1:size(allsubs_seg_ind{s},2)),1);
end
within_sub_reliability_v2
for t = 1:length(times)
tmp = [];
for s = 1:numel(subject)
if t <= size(means_diff{1,s},2)
tmp = [tmp;means_diff{1,s}(t)]
else
continue;
end
end
mean_of_means(t) = mean(tmp);
end
```

```
plot(times_all,mean_of_means, ':', 'Color', [0,0,0], 'LineWidth',3)
plot(times_all(1:40),mean_of_means(1:40), ':', 'Color', [0,0,0], 'LineWidth',3)
plot(times_all(1,1:40),mean_of_means(1:40), ':', 'Color', [0,0,0], 'LineWidth',3)
within_sub_reliability_v2
save('/Users/dianaperez/Desktop/segregation_index_data_for_plots.mat',↙
'allsubs_abs_diffs', 'allsubs_seg_ind', 'times_all', 'mean_of_means', 'rgb_colors_iNet',↙
'rgb_colors_LS', 'subject')
within_sub_reliability_v2
figure;
for s = 1:numel(subject)
plot(times_all(s,1:size(allsubs_seg_ind{s},2)),mean(allsubs_seg_ind{1,s}(:,1:size↙
(allsubs_seg_ind{s},2)),1),'Color',rgb_colors_LS(s,:),'LineWidth', 3)
hold on
end
figure;
for s = 1:numel(subject)
plot(times_all(s,1:size(allsubs_seg_ind{s},2)),mean(allsubs_seg_ind{1,s}(:,1:size↙
(allsubs_seg_ind{s},2)),1),'Color',rgb_colors_LS(s,:),'LineWidth', 3)
hold on
end
for t = 1:length(times)
tmp = [];
for s = 1:numel(subject)
if t <= size(allsubs_seg_ind{1,s},2)
tmp = [tmp;allsubs_seg_ind{1,s}(t)];
else
continue;
end
end
mean_of_means_SI(t) = mean(tmp);
end
%means = [0.228121374   0.282854956 0.311825923 0.330394855 0.344075468 0.3540615↙
0.362085299 0.368580906 0.374353669 0.378886496 0.38303392  0.386997298 0.39018919↙
0.392779018 0.395671349 0.3921087   0.394652817 0.396349383 0.398223    0.39998822↙
0.401678269 0.402921549 0.404130596 0.405287927 0.406779144 0.407857626 0.408819803↙
0.40779906  0.4087539   0.409494202 0.41042813  0.411371703 0.4121878   0.412706817↙
0.413360333 0.414032785 0.41465492  0.419794232 0.420634614 0.420983464 0.421506702↙
0.421954376 0.422355276 0.42278862  0.423175282 0.42350195  0.423740618 0.42402081↙
0.434813233 0.42669529  0.42691267  0.42712188  0.42740375];
plot(times_all(1,1:40),mean_of_means_SI(1:40), ':', 'Color', [0,0,0], 'LineWidth',3)
figure;
for s = 1:numel(subject)
plot(times_all(s,1:size(allsubs_between_FC{s},2)),mean(allsubs_between_FC{1,s}(:,1:size↙
(allsubs_between_FC{s},2)),1),'Color',rgb_colors_LS(s,:),'LineWidth', 3)
hold on
end
for t = 1:length(times)
tmp = [];
for s = 1:numel(subject)
if t <= size(allsubs_between_FC{1,s},2)
tmp = [tmp;allsubs_between_FC{1,s}(t)];
else
continue;
end
end
mean_of_means_bFC(t) = mean(tmp);
end
%means = [0.228121374   0.282854956 0.311825923 0.330394855 0.344075468 0.3540615↙
0.362085299 0.368580906 0.374353669 0.378886496 0.38303392  0.386997298 0.39018919↙
0.392779018 0.395671349 0.3921087   0.394652817 0.396349383 0.398223    0.39998822↙
```

```
0.401678269 0.402921549 0.404130596 0.405287927 0.406779144 0.407857626 0.408819803↙
0.40779906  0.4087539   0.409494202 0.41042813  0.411371703 0.4121878   0.412706817↙
0.413360333 0.414032785 0.41465492  0.419794232 0.420634614 0.420983464 0.421506702↙
0.421954376 0.422355276 0.42278862  0.423175282 0.42350195  0.423740618 0.42402081↙
0.434813233 0.42669529  0.42691267  0.42712188  0.42740375];
plot(times_all(1,1:40),mean_of_means_bFC(1:40), ':', 'Color', [0,0,0], 'LineWidth',3)
%axis([0 120 0.1 .5])
ylabel('Between FC');
xlabel('Time (Minutes)');
figure;
for s = 1:numel(subject)
plot(times_all(s,1:size(allsubs_within_FC{s},2)),mean(allsubs_within_FC{1,s}(:,1:size↙
(allsubs_wihtin_FC{s},2)),1),'Color',rgb_colors_LS(s,:),'LineWidth', 3)
hold on
end
for t = 1:length(times)
tmp = [];
for s = 1:numel(subject)
if t <= size(allsubs_within_FC{1,s},2)
tmp = [tmp;allsubs_within_FC{1,s}(t)];
else
continue;
end
end
mean_of_means_wFC(t) = mean(tmp);
end
%means = [0.228121374   0.282854956 0.311825923 0.330394855 0.344075468 0.3540615↙
0.362085299 0.368580906 0.374353669 0.378886496 0.38303392  0.386997298 0.39018919↙
0.392779018 0.395671349 0.3921087   0.394652817 0.396349383 0.398223    0.39998822↙
0.401678269 0.402921549 0.404130596 0.405287927 0.406779144 0.407857626 0.408819803↙
0.40779906  0.4087539   0.409494202 0.41042813  0.411371703 0.4121878   0.412706817↙
0.413360333 0.414032785 0.41465492  0.419794232 0.420634614 0.420983464 0.421506702↙
0.421954376 0.422355276 0.42278862  0.423175282 0.42350195  0.423740618 0.42402081↙
0.434813233 0.42669529  0.42691267  0.42712188  0.42740375];
plot(times_all(1,1:40),mean_of_means_wFC(1:40), ':', 'Color', [0,0,0], 'LineWidth',3)
%axis([0 120 0.1 .5])
ylabel('Within FC');
xlabel('Time (Minutes)');
figure;
for s = 1:numel(subject)
plot(times_all(s,1:size(allsubs_within_FC{s},2)),mean(allsubs_within_FC{1,s}(:,1:size↙
(allsubs_within_FC{s},2)),1),'Color',rgb_colors_LS(s,:),'LineWidth', 3)
hold on
end
for t = 1:length(times)
tmp = [];
for s = 1:numel(subject)
if t <= size(allsubs_within_FC{1,s},2)
tmp = [tmp;allsubs_within_FC{1,s}(t)];
else
continue;
end
end
mean_of_means_wFC(t) = mean(tmp);
end
%means = [0.228121374   0.282854956 0.311825923 0.330394855 0.344075468 0.3540615↙
0.362085299 0.368580906 0.374353669 0.378886496 0.38303392  0.386997298 0.39018919↙
0.392779018 0.395671349 0.3921087   0.394652817 0.396349383 0.398223    0.39998822↙
0.401678269 0.402921549 0.404130596 0.405287927 0.406779144 0.407857626 0.408819803↙
0.40779906  0.4087539   0.409494202 0.41042813  0.411371703 0.4121878   0.412706817↙
```

```
0.413360333 0.414032785 0.41465492  0.419794232 0.420634614 0.420983464 0.421506702↙
0.421954376 0.422355276 0.42278862  0.423175282 0.42350195  0.423740618 0.42402081↙
0.434813233 0.42669529  0.42691267  0.42712188  0.42740375];
plot(times_all(1,1:40),mean_of_means_wFC(1:40), ':', 'Color', [0,0,0], 'LineWidth',3)
%axis([0 120 0.1 .5])
ylabel('Within FC');
xlabel('Time (Minutes)');
leg_names = ['Mean' subject]
leg_names = ['Mean' flip(subject)]
within_sub_reliability_v2
figure;
for s = 1:numel(subject)
plot(times_all(s,1:size(allsubs_between_FC{s},2)),mean(allsubs_between_FC{1,s}(:,1:size↙
(allsubs_between_FC{s},2)),1),'Color',rgb_colors_LS(s,:),'LineWidth', 3)
hold on
end
for t = 1:length(times)
tmp = [];
for s = 1:numel(subject)
if t <= size(allsubs_between_FC{1,s},2)
tmp = [tmp;allsubs_between_FC{1,s}(t)];
else
continue;
end
end
mean_of_means_bFC(t) = mean(tmp);
end
%means = [0.228121374   0.282854956 0.311825923 0.330394855 0.344075468 0.3540615↙
0.362085299 0.368580906 0.374353669 0.378886496 0.38303392  0.386997298 0.39018919↙
0.392779018 0.395671349 0.3921087   0.394652817 0.396349383 0.398223    0.39998822↙
0.401678269 0.402921549 0.404130596 0.405287927 0.406779144 0.407857626 0.408819803↙
0.40779906  0.4087539   0.409494202 0.41042813  0.411371703 0.4121878   0.412706817↙
0.413360333 0.414032785 0.41465492  0.419794232 0.420634614 0.420983464 0.421506702↙
0.421954376 0.422355276 0.42278862  0.423175282 0.42350195  0.423740618 0.42402081↙
0.434813233 0.42669529  0.42691267  0.42712188  0.42740375];
plot(times_all(1,1:40),mean_of_means_bFC(1:40), ':', 'Color', [0,0,0], 'LineWidth',3)
%axis([0 120 0.1 .5])
ylabel('Between FC');
xlabel('Time (Minutes)');
figure;
for s = 1:numel(subject)
plot(times_all(s,1:size(allsubs_within_FC{s},2)),mean(allsubs_within_FC{1,s}(:,1:size↙
(allsubs_within_FC{s},2)),1),'Color',rgb_colors_LS(s,:),'LineWidth', 3)
hold on
end
for t = 1:length(times)
tmp = [];
for s = 1:numel(subject)
if t <= size(allsubs_within_FC{1,s},2)
tmp = [tmp;allsubs_within_FC{1,s}(t)];
else
continue;
end
end
mean_of_means_wFC(t) = mean(tmp);
end
%means = [0.228121374   0.282854956 0.311825923 0.330394855 0.344075468 0.3540615↙
0.362085299 0.368580906 0.374353669 0.378886496 0.38303392  0.386997298 0.39018919↙
0.392779018 0.395671349 0.3921087   0.394652817 0.396349383 0.398223    0.39998822↙
0.401678269 0.402921549 0.404130596 0.405287927 0.406779144 0.407857626 0.408819803↙
```

```
0.40779906  0.4087539   0.409494202 0.41042813  0.411371703 0.4121878   0.412706817↙
0.413360333 0.414032785 0.41465492  0.419794232 0.420634614 0.420983464 0.421506702↙
0.421954376 0.422355276 0.42278862  0.423175282 0.42350195  0.423740618 0.42402081↙
0.434813233 0.42669529  0.42691267  0.42712188  0.42740375];
plot(times_all(1,1:40),mean_of_means_wFC(1:40), ':', 'Color', [0,0,0], 'LineWidth',3)
%axis([0 120 0.1 .5])
ylabel('Within FC');
xlabel('Time (Minutes)');
within_sub_reliability_v2
figure;
for s = 1:numel(subject)
plot(times_all(s,1:size(allsubs_seg_ind{s},2)),mean(allsubs_abs_diffs{1,s}(:,1:size↙
(allsubs_seg_ind{s},2)),1), 'Color', rgb_colors_LS, 'LineWidth', 3)
hold on
means_diff{s} = mean(allsubs_abs_diffs{1,s}(:,1:size(allsubs_seg_ind{s},2)),1);
end
rgb_colors_LS{s}
rgb_colors_LS{s,:}
rgb_colors_LS(s,:)
for s = 1:numel(subject)
plot(times_all(s,1:size(allsubs_seg_ind{s},2)),mean(allsubs_abs_diffs{1,s}(:,1:size↙
(allsubs_seg_ind{s},2)),1), 'Color', rgb_colors_LS(s,:), 'LineWidth', 3)
hold on
means_diff{s} = mean(allsubs_abs_diffs{1,s}(:,1:size(allsubs_seg_ind{s},2)),1);
end
for t = 1:length(times)
tmp = [];
for s = 1:numel(subject)
if t <= size(means_diff{1,s},2)
tmp = [tmp;means_diff{1,s}(t)];
else
continue;
end
end
mean_of_means(t) = mean(tmp);
end
%mean_diff_all = [0.451054915   0.31958749  0.250078328 0.205589374 0.173270193↙
0.149834654 0.130898036 0.116096011 0.103579279 0.09357542  0.085252215 0.077510628↙
0.071893195 0.067765274 0.063014982 0.0609474   0.057319998 0.055589204 0.053587631↙
0.051688755 0.049855826 0.049189074 0.047716066 0.047485058 0.046371319 0.046092851↙
0.045026644 0.049051036 0.048147125 0.04798667  0.047803287 0.048079218 0.047927852↙
0.047976362 0.048676489 0.048785449 0.048605224 0.048932758 0.049221036 0.049052662↙
0.049501161 0.049540971 0.049734258 0.04993298  0.050447245 0.050401381 0.0504621↙
0.050506165 0.048969311 0.042753616 0.042789566 0.043138017 0.043480223 0.026972895];
plot(times_all(1,1:40),mean_of_means(1:40), ':', 'Color', [0,0,0], 'LineWidth',3)
axis([0 100 0 .6])
ylabel('% Difference');
xlabel('Time (Minutes)');
m = findobj(gca,'Type','line');
hleg1 = legend(m(1:(numel(subject)+1)), ['Mean' flip(subject)], 'Location', 'NorthEast');
hleg1.FontSize = 20;
ax = gca;
ax.FontSize = 24;
print(gcf,'/Users/dianaperez/Desktop/ReliabilityLifespanSegIndex_Diff.jpg'],'-dpng','-↙
r300');
print(gcf,'/Users/dianaperez/Desktop/ReliabilityLifespanSegIndex_Diff.jpg','-dpng','-↙
r300');
figure;
for s = 1:numel(subject)
plot(times_all(s,1:size(allsubs_seg_ind{s},2)),mean(allsubs_seg_ind{1,s}(:,1:size↙
```

```
(allsubs_seg_ind{s},2)),1),'Color',rgb_colors_LS(s,:),'LineWidth', 3)
hold on
end
for t = 1:length(times)
tmp = [];
for s = 1:numel(subject)
if t <= size(allsubs_seg_ind{1,s},2)
tmp = [tmp;allsubs_seg_ind{1,s}(t)];
else
continue;
end
end
mean_of_means_SI(t) = mean(tmp);
end
size(allsubs_seg_ind{1,s},2)
for t = 1:length(times)
tmp = [];
for s = 1:numel(subject)
if t <= size(allsubs_seg_ind{1,s},2)
tmp = [tmp;mean(allsubs_seg_ind{1,s}(t))];
else
continue;
end
end
mean_of_means_SI(t) = mean(tmp);
end
mean(allsubs_seg_ind{1,1}(1))
mean(allsubs_seg_ind{1,2}(1))
mean(allsubs_seg_ind{1,3}(1))
mean(allsubs_seg_ind{1,1}(2))
mean(allsubs_seg_ind{1,1}(3))
t = 1;
tmp = [];
for s = 1:numel(subject)
if t <= size(allsubs_seg_ind{1,s},2)
tmp = [tmp;mean(allsubs_seg_ind{1,s}(t))];
else
continue;
end
end
mean_of_means_SI(t) = mean(tmp);
mean_of_means_SI(t) = mean(tmp)
t = 2;
tmp = [];
for s = 1:numel(subject)
if t <= size(allsubs_seg_ind{1,s},2)
tmp = [tmp;mean(allsubs_seg_ind{1,s}(t))];
else
continue;
end
end
mean_of_means_SI(t) = mean(tmp)
t = 3;
tmp = [];
for s = 1:numel(subject)
if t <= size(allsubs_seg_ind{1,s},2)
tmp = [tmp;mean(allsubs_seg_ind{1,s}(t))];
else
continue;
end
```

```
end
mean_of_means_SI(t) = mean(tmp)
mean(tmp)
length(times)
allsubs_seg_ind{1,t}
allsubs_seg_ind{1,1}(1)
allsubs_seg_ind{1,1}(:,1)
for t = 1:length(times)
tmp = [];
for s = 1:numel(subject)
if t <= size(allsubs_seg_ind{1,s},2)
tmp = [tmp;mean(allsubs_seg_ind{1,s}(:,t))];
else
continue;
end
end
mean_of_means_SI(t) = mean(tmp);
end
plot(times_all(1,1:40),mean_of_means_SI(1:40), ':', 'Color', [0,0,0], 'LineWidth',3)
plot(times_all(1,1:40),smooth(mean_of_means_SI(1:40)), ':', 'Color', [0,0,0],↙
'LineWidth',3)
help smooth
axis([0 100 0.1 .5])
ylabel('Segregation Index');
xlabel('Time (Minutes)');
m = findobj(gca,'Type','line');
hleg1 = legend(m(1:(numel(subject)+1)), ['Mean' flip(subject)], 'Location', 'NorthEast');
hleg1.FontSize = 20;
ax = gca;
ax.FontSize = 20;
axis([0 100 0 .4])
axis([0 100 -0.1 .4])
hleg1 = legend(m(1:(numel(subject)+1)), ['Mean' flip(subject)], 'Location', 'SouthEast');
axis([0 100 -0.2 .5])
axis([0 100 -0.2 .4])
print(gcf,[output_dir '/ReliabilityLifespanSegIndex.jpg'],'-dpng','-r300');
print(gcf,'/Users/dianaperez/Desktop/ReliabilityLifespanSegIndex.jpg','-dpng','-r300');
size(allsubs_between_FC{1},2)
size(allsubs_between_FC{2},2)
allsubs_between_FC{1,s}(:,1:size(allsubs_between_FC{s},2))
mean(allsubs_between_FC{1,s}(:,1:size(allsubs_between_FC{s},2)),1)
figure;
s = 1;
plot(times_all(s,1:size(allsubs_between_FC{s},2)),mean(allsubs_between_FC{1,s}(:,1:size↙
(allsubs_between_FC{s},2)),1),'Color',rgb_colors_LS(s,:),'LineWidth', 3)
hold on
s = 2;
plot(times_all(s,1:size(allsubs_between_FC{s},2)),mean(allsubs_between_FC{1,s}(:,1:size↙
(allsubs_between_FC{s},2)),1),'Color',rgb_colors_LS(s,:),'LineWidth', 3)
hold on
s = 3;
plot(times_all(s,1:size(allsubs_between_FC{s},2)),mean(allsubs_between_FC{1,s}(:,1:size↙
(allsubs_between_FC{s},2)),1),'Color',rgb_colors_LS(s,:),'LineWidth', 3)
hold on
times_all(s,1:size(allsubs_between_FC{s},2)
times_all(s,1:size(allsubs_between_FC{s},2))
figure;
for s = 1:numel(subject)
plot(times_all(2,1:size(allsubs_between_FC{s},2)),mean(allsubs_between_FC{1,s}(:,1:size↙
(allsubs_between_FC{s},2)),1),'Color',rgb_colors_LS(s,:),'LineWidth', 3)
```

```
hold on
end
for s = 1:numel(subject)
x = mean(allsubs_between_FC{1,s}(:,1:size(allsubs_between_FC{s},2)),1);
end
for s = 1:numel(subject)
x(s,:) = mean(allsubs_between_FC{1,s}(:,1:size(allsubs_between_FC{s},2)),1);
end
x = mean(allsubs_between_FC{1,s}(:,1:size(allsubs_between_FC{s},2)),1);
figure;
plot(times_all(2,1:size(allsubs_between_FC{s},2)),mean(allsubs_between_FC{1,s}(:,1:size↙
(allsubs_between_FC{s},2)),1),'Color',rgb_colors_LS(s,:),'LineWidth', 3)
hold on
s = 2;
plot(times_all(2,1:size(allsubs_between_FC{s},2)),mean(allsubs_between_FC{1,s}(:,1:size↙
(allsubs_between_FC{s},2)),1),'Color',rgb_colors_LS(s,:),'LineWidth', 3)
hold on
s = 3;
plot(times_all(2,1:size(allsubs_between_FC{s},2)),mean(allsubs_between_FC{1,s}(:,1:size↙
(allsubs_between_FC{s},2)),1),'Color',rgb_colors_LS(s,:),'LineWidth', 3)
hold on
mean(allsubs_between_FC{1,s}(:,1:size(allsubs_between_FC{s},2)),1)
s = 4;
plot(times_all(2,1:size(allsubs_between_FC{s},2)),mean(allsubs_between_FC{1,s}(:,1:size↙
(allsubs_between_FC{s},2)),1),'Color',rgb_colors_LS(s,:),'LineWidth', 3)
s = 5;
hold on
plot(times_all(2,1:size(allsubs_between_FC{s},2)),mean(allsubs_between_FC{1,s}(:,1:size↙
(allsubs_between_FC{s},2)),1),'Color',rgb_colors_LS(s,:),'LineWidth', 3)
s = 6;
hold on
plot(times_all(2,1:size(allsubs_between_FC{s},2)),mean(allsubs_between_FC{1,s}(:,1:size↙
(allsubs_between_FC{s},2)),1),'Color',rgb_colors_LS(s,:),'LineWidth', 3)
hold on
s = 7;
plot(times_all(2,1:size(allsubs_between_FC{s},2)),mean(allsubs_between_FC{1,s}(:,1:size↙
(allsubs_between_FC{s},2)),1),'Color',rgb_colors_LS(s,:),'LineWidth', 3)
figure;
for s = 1:numel(subject)
plot(times_all(2,1:size(allsubs_seg_ind{s},2)),mean(allsubs_between_FC{1,s}(:,1:size↙
(allsubs_seg_ind{s},2)),1),'Color',rgb_colors_LS(s,:),'LineWidth', 3)
hold on
end
for t = 1:length(times)
tmp = [];
for s = 1:numel(subject)
if t <= size(allsubs_seg_ind{1,s},2)
tmp = [tmp;allsubs_between_FC{1,s}(t)];
else
continue;
end
end
mean_of_means_bFC(t) = mean(tmp);
end
plot(times_all(1,1:40),mean_of_means_bFC(1:40), ':', 'Color', [0,0,0], 'LineWidth',3)
for t = 1:length(times)
tmp = [];
for s = 1:numel(subject)
if t <= size(allsubs_seg_ind{1,s},2)
tmp = [tmp;mean(allsubs_between_FC{1,s}(t))];
```

```
else
continue;
end
end
mean_of_means_bFC(t) = mean(tmp);
end
for t = 1:length(times)
tmp = [];
for s = 1:numel(subject)
if t <= size(allsubs_seg_ind{1,s},2)
tmp = [tmp;mean(allsubs_between_FC{1,s}(:,t))];
else
continue;
end
end
mean_of_means_bFC(t) = mean(tmp);
end
%means = [0.228121374   0.282854956 0.311825923 0.330394855 0.344075468 0.3540615↙
0.362085299 0.368580906 0.374353669 0.378886496 0.38303392  0.386997298 0.39018919↙
0.392779018 0.395671349 0.3921087   0.394652817 0.396349383 0.398223    0.39998822↙
0.401678269 0.402921549 0.404130596 0.405287927 0.406779144 0.407857626 0.408819803↙
0.40779906  0.4087539   0.409494202 0.41042813  0.411371703 0.4121878   0.412706817↙
0.413360333 0.414032785 0.41465492  0.419794232 0.420634614 0.420983464 0.421506702↙
0.421954376 0.422355276 0.42278862  0.423175282 0.42350195  0.423740618 0.42402081↙
0.434813233 0.42669529  0.42691267  0.42712188  0.42740375];
plot(times_all(1,1:40),mean_of_means_bFC(1:40), ':', 'Color', [0,0,0], 'LineWidth',3)
figure;
for s = 1:numel(subject)
plot(times_all(2,1:size(allsubs_seg_ind{s},2)),mean(allsubs_between_FC{1,s}(:,1:size↙
(allsubs_seg_ind{s},2)),1),'Color',rgb_colors_LS(s,:),'LineWidth', 3)
hold on
end
for t = 1:length(times)
tmp = [];
for s = 1:numel(subject)
if t <= size(allsubs_seg_ind{1,s},2)
tmp = [tmp;mean(allsubs_between_FC{1,s}(:,t))];
else
continue;
end
end
mean_of_means_bFC(t) = mean(tmp);
end
%means = [0.228121374   0.282854956 0.311825923 0.330394855 0.344075468 0.3540615↙
0.362085299 0.368580906 0.374353669 0.378886496 0.38303392  0.386997298 0.39018919↙
0.392779018 0.395671349 0.3921087   0.394652817 0.396349383 0.398223    0.39998822↙
0.401678269 0.402921549 0.404130596 0.405287927 0.406779144 0.407857626 0.408819803↙
0.40779906  0.4087539   0.409494202 0.41042813  0.411371703 0.4121878   0.412706817↙
0.413360333 0.414032785 0.41465492  0.419794232 0.420634614 0.420983464 0.421506702↙
0.421954376 0.422355276 0.42278862  0.423175282 0.42350195  0.423740618 0.42402081↙
0.434813233 0.42669529  0.42691267  0.42712188  0.42740375];
plot(times_all(1,1:40),mean_of_means_bFC(1:40), ':', 'Color', [0,0,0], 'LineWidth',3)
axis([0 100 0 .2])
axis([0 100 0.06 .2])
ylabel('Between-network FC');
xlabel('Time (Minutes)');
m = findobj(gca,'Type','line');
hleg1 = legend(m(1:(numel(subject)+1)), ['Mean' flip(subject)], 'Location', 'NorthEast');
hleg1.FontSize = 20;
ax = gca;
```

```
ax.FontSize = 20;
axis([0 100 0.06 .25])
print(gcf,'/Users/dianaperez/Desktop/ReliabilityBetweenFC.jpg','-dpng','-r300')
figure;
for s = 1:numel(subject)
plot(times_all(s,1:size(allsubs_seg_ind{s},2)),mean(allsubs_within_FC{1,s}(:,1:size↙
(allsubs_seg_ind{s},2)),1),'Color',rgb_colors_LS(s,:),'LineWidth', 3)
hold on
end
for t = 1:length(times)
tmp = [];
for s = 1:numel(subject)
if t <= size(allsubs_seg_ind{1,s},2)
tmp = [tmp;allsubs_within_FC{1,s}(:,t)];
else
continue;
end
end
mean_of_means_wFC(t) = mean(tmp);
end
%means = [0.228121374   0.282854956 0.311825923 0.330394855 0.344075468 0.3540615↙
0.362085299 0.368580906 0.374353669 0.378886496 0.38303392  0.386997298 0.39018919↙
0.392779018 0.395671349 0.3921087   0.394652817 0.396349383 0.398223    0.39998822↙
0.401678269 0.402921549 0.404130596 0.405287927 0.406779144 0.407857626 0.408819803↙
0.40779906  0.4087539   0.409494202 0.41042813  0.411371703 0.4121878   0.412706817↙
0.413360333 0.414032785 0.41465492  0.419794232 0.420634614 0.420983464 0.421506702↙
0.421954376 0.422355276 0.42278862  0.423175282 0.42350195  0.423740618 0.42402081↙
0.434813233 0.42669529  0.42691267  0.42712188  0.42740375];
plot(times_all(1,1:40),mean_of_means_wFC(1:40), ':', 'Color', [0,0,0], 'LineWidth',3)
axis([0 100 0.09 .3])
ylabel('Within FC');
xlabel('Time (Minutes)');
output_dir = '/Users/dianaperez/Desktop/';
m = findobj(gca,'Type','line');
hleg1 = legend(m(1:(numel(subject)+1)), ['Mean' flip(subject)], 'Location', 'NorthEast');
hleg1.FontSize = 20;
ax = gca;
ax.FontSize = 20;
print(gcf,[output_dir '/ReliabilityWithinFC.jpg'],'-dpng','-r300');
xlabel('Time (Minutes)');
ylabel('Pearson correlation (r)');
ax = gca;
ax.FontSize = 20;
within_sub_reliability_v2
length(atlas_params.networks)
size(atlas_params.networks,ind)
within = tmp_within(maskmat);
within(within<0) = [];
system_divisions(sys)
similarity_analysis_by_system
maskmat = ones(size(corrmat_matched_data,1));
maskmat = logical(triu(maskmat, 1));
matcheddata_corrlin(count,:) = single(FisherTransform(corrmat_matched_data(maskmat)));
similarity_analysis_by_system
title('Correlation Matrix Similarity - sensorimotor systems');
output_str = {'sensorimotor_systems', 'control_systems'};
title(['Correlation Matrix Similarity - ');
title(['Correlation Matrix Similarity - ' output_str(1)]);
title(['Correlation Matrix Similarity - ' output_str{1}]);
similarity_analysis_by_system
```

```
title('Correlation Matrix Similarity - sensorimotor');
similarity_analysis_by_system
disp(['The average similarity between subjects for ' output_str{sys} ' is ' num2str(mean↙
(between))])
disp(['The average similarity within subjects for ' output_str{sys} ' is ' num2str(mean↙
(within))]
disp(['The average similarity within subjects for ' output_str{sys} ' is ' num2str(mean↙
(within))]
disp(['The average similarity within subjects for ' output_str{sys} ' is ' num2str(mean↙
(within))]))
disp(['The average similarity between subjects for ' output_str{sys} ' is ' num2str(mean↙
(between))])
disp(['The average similarity within subjects for ' output_str{sys} ' is ' num2str(mean↙
(within))])
similarity_analysis_by_system
help gifti
clear all
gii_surf = gifti('/Volumes/fsmresfiles/PBS/Gratton_Lab/Lifespan/Pre-↙
COVID/BIDS/Nifti/derivatives/freesurfer-6.0.1/FREESURFER_fs_LR/sub-↙
LS02/NativeVol/fsaverage_LR32k/sub-LS02.L.midthickness.32k_fs_LR.surf.gii';
gii_surf = gifti('/Volumes/fsmresfiles/PBS/Gratton_Lab/Lifespan/Pre-↙
COVID/BIDS/Nifti/derivatives/freesurfer-6.0.1/FREESURFER_fs_LR/sub-↙
LS02/NativeVol/fsaverage_LR32k/sub-LS02.L.midthickness.32k_fs_LR.surf.gii');
gii_coord = gifti('/Volumes/fsmresfiles/PBS/Gratton_Lab/Lifespan/Pre-↙
COVID/BIDS/Nifti/derivatives/freesurfer-6.0.1/FREESURFER_fs_LR/sub-↙
LS02/NativeVol/fsaverage_LR32k/sub-LS02.L.midthickness.32k_fs_LR.coord.gii');
gii_surf(:,1)
gii_surf.vertices(:,1)
gii_surf.vertices(1,:)
gii_coord.vertices(1,:)
gii_surf = load('/Volumes/fsmresfiles/PBS/Gratton_Lab/Lifespan/Pre-↙
COVID/BIDS/Nifti/derivatives/freesurfer-6.0.1/FREESURFER_fs_LR/sub-↙
LS02/NativeVol/fsaverage_LR32k/sub-LS02.L.midthickness.32k_fs_LR.surf.gii';
gii_surf = load('/Volumes/fsmresfiles/PBS/Gratton_Lab/Lifespan/Pre-↙
COVID/BIDS/Nifti/derivatives/freesurfer-6.0.1/FREESURFER_fs_LR/sub-↙
LS02/NativeVol/fsaverage_LR32k/sub-LS02.L.midthickness.32k_fs_LR.surf.gii');
gii_coord.mat;
indparcels_distmats_gw
clear gii*
clear ans
%-- 2/27/23, 4:50 PM --%
make_geo_dist_matrix
addpath '/Users/dianaperez/Documents/GitHub/General_Scripts/gifti-master/@gifti'
make_geo_dist_matrix
addpath '/Users/dianaperez/Documents/GitHub/General_Scripts/gifti-master/@gifti'
make_geo_dist_matrix
cd '/Users/dianaperez/Documents/GitHub/General_Scripts/gifti-master/@gifti'
make_geo_dist_matrix
L_surf_name
L_surf_fname
make_geo_dist_matrix
%-- 2/28/23, 3:06 PM --%
similarity_analysis_by_system
addpath '/Users/dianaperez/Documents/GitHub/GrattonLab-General-Repo/FCProcess'
similarity_analysis_by_system
addpath '/Users/dianaperez/Documents/GitHub/Lifespan-Analysis/utilities'
similarity_analysis_by_system
addpath '/Users/dianaperez/Documents/GitHub/General_Scripts'
similarity_analysis_by_system
output_str{sys}
```

```
sys
output_str = {'sensorimotor', 'control'};
title(['Correlation Matrix Similarity - ' output_str{sys}]);
if match_data
saveas(gcf,[output_dir data_set '_' atlas '_' output_str{sys}↙
'_similarityMat_matchedData_' num2str(amt_data) '.tiff'],'tiff');
else
saveas(gcf,[output_dir data_set '_' atlas '_' output_str{sys}↙
'_similarityMat_unMatchedData.tiff'],'tiff');
end
close('all');
%% CALCULATE average within- and between-subject correlations
count = 1;
within = [];
between = [];
for s = 1:numel(subject)
lines = [count:(count+sessions-1)];
sub_vals = simmat(lines,:);
maskmat = ones(sessions,sessions);
maskmat = logical(triu(maskmat, 1));
within_sub = sub_vals(:,lines);
within = [within; within_sub(maskmat)];
maskmat = ones(size(sub_vals));
maskmat(:,lines) = 0;
between = [between; sub_vals(maskmat==1)];
count = count+sessions;
end
disp(['The average similarity between subjects for ' output_str{sys} ' is ' num2str(mean↙
(between))])
disp(['The average similarity within subjects for ' output_str{sys} ' is ' num2str(mean↙
(within))])
similarity_analysis_by_system
%-- 3/5/23, 2:16 PM --%
segregation_ind_by_ses
addpath '/Users/dianaperez/Documents/GitHub/GrattonLab-General-Repo/FCProcess'
segregation_ind_by_ses
addpath '/Users/dianaperez/Documents/GitHub/Lifespan-Analysis/utilities'
segregation_ind_by_ses
addpath '/Users/dianaperez/Documents/GitHub/General_Scripts'
segregation_ind_by_ses
matrix_sorted = matrix(atlas_params.sorti);
matched_data_sorted = matched_data(atlas_params.sorti);
matched_data_sorted = matched_data(atlas_params.sorti,:);
matched_data_sorted = matched_data(atlas_params.sorti,:);
matrix = paircorr_mod(matched_data_sorted');
matrix = single(FisherTransform(matrix));
imgesc(matrix)
imagesc(matrix)
load better_jet_colormap.mat; % assume this is in the same folder
colormap(better_jet_colormap_diff);
imagesc(matrix, -1, 1)
imagesc(matrix, [-1 1])
net == 1
segregation_ind_by_ses
rois(end)
segregation_ind_by_ses
strcmpi(neg_corrs, 'nan')
segregation_ind_by_ses
[output_dir data_set '_allsubs_seg_index_ses_negcorrs' neg_corrs '_' atlas '.mat']
segregation_ind_by_ses
```

```
mean(all_within)
segregation_ind_by_ses
mean(all_within)
mean(all_between)
mean(all_within)
segregation_ind_by_ses
size(atlas_params.networks)
length(atlas_params.networks)
segregation_ind_by_ses
clear all
load↙
('/Users/dianaperez/Desktop/Research/Segregation_Analyses/Lifespan_allsubs_seg_index_ses_↙
negcorrsnan_Seitzman300.mat')
all_OA_subs = load↙
('/Users/dianaperez/Desktop/Research/Segregation_Analyses/Lifespan_allsubs_seg_index_ses_↙
negcorrsnan_Seitzman300.mat')
all_OA_subs = all_OA_subs.ses_SI;
make_figures
pre_first_ses = [0.40465483 0.47502443 0.42045888];
pre_first_ses = [0.40465483 0.47502443 0.42045888];
post_first_ses = [0.35866937 0.35903123 0.39794636 0.39622128 0.37635228 0.48386648↙
0.45387810 0.50429422 0.49092054 0.35866398 0.49722296 0.45307758 0.44976237 0.40819031↙
0.39566854];
[pre_first_ses post_first_ses]
make_figures
handles = plotSpread(first_ses_long_OA', 'distributionMarkers', {'+'},↙
'distributionColors', rgb_for_long', 'xNames', subs)
make_figures
close all
make_figures
axis([0 19 .5 1.5])
axis([0 19 .7 1.1])
axis([0 19 .8 1.1])
axis([0 19 .8 1.05])
ax = gca;
ax.FontSize = 20;
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.3, 0.7]); %first and second↙
control position on screen, third controls width, and fourth controls height
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.7, 0.3]); %first and second↙
control position on screen, third controls width, and fourth controls height
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 0.7, 0.5]); %first and second↙
control position on screen, third controls width, and fourth controls height
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 1, 0.5]); %first and second↙
control position on screen, third controls width, and fourth controls height
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.3, 0.3, 1, 0.7]); %first and second↙
control position on screen, third controls width, and fourth controls height
print(gcf, [output_dir 'SegInd_stability_negcorrs' neg_corrs '_' atlas '.jpg'], '-dpng',↙
'-r300')
make_figures
addpath↙
'/Users/dianaperez/Documents/GitHub/PerezEtAl_HemAsymmetries/needed_files/plotSpread/plot↙
Spread'
make_figures
axis([0 19 0.6 0.8])
make_figures
axis([0 19 0.4 0.6])
make_figures
close all
clear all
make_figures
```

```
axis([0 19 .25 .6])
make_figures
close all
make_figures
axis([0 19 .4 .8])
axis([0 19 .5 .8])
make_figures
axis([0 19 .8 1.05]) % for the as is neg corrs parcels333
axis([0 19 .8 1.1]) % for the as is neg corrs parcels333
axis([0 19 .8 1.2]) % for the as is neg corrs parcels333
axis([0 19 .8 1.15]) % for the as is neg corrs parcels333
axis([0 19 .9 1.15]) % for the as is neg corrs parcels333
axis([0 19 .85 1.15]) % for the as is neg corrs parcels333
axis([0 19 .85 1.15])
clear all
%% some paths
data_dir = '/Users/dianaperez/Desktop/Research/Segregation_Analyses/';
output_dir = '/Users/dianaperez/Desktop/Research/Segregation_Analyses/';
%% some variables
% I don't think I'll need these, but just in case
subs = {'LS02', 'LS03', 'LS05', 'LS08', 'LS11', 'LS14',↙
'LS16','LS17','INET001','INET002',↙
'INET003','INET005','INET006','INET010','INET016','INET018','INET019','INET030'};
%% first load the first batch
neg_corrs = 'asis'; % choose: 'nan', 'zero', 'asis'
atlas = 'Seitzman300'; % 'Seitzman300' or 'Parcels333'
%% load all the files
% these are the TimeB segregation indices for older adults
OA_vol_asis = load([data_dir 'Lifespan_allsubs_seg_index_ses_negcorrs' neg_corrs '_'↙
atlas '.mat']);
OA_vol_asis = OA_vol_asis.ses_SI;
% these are the segregation indices for young adults
YA_vol_asis = load([data_dir 'iNetworks_allsubs_seg_index_ses_negcorrs' neg_corrs '_'↙
atlas '.mat']);
YA_vol_asis = YA_vol_asis.ses_SI;
%% load the next batch
neg_corrs = 'zero'; % choose: 'nan', 'zero', 'asis'
atlas = 'Seitzman300'; % 'Seitzman300' or 'Parcels333'
%% load all the files
% these are the TimeB segregation indices for older adults
OA_vol_zero = load([data_dir 'Lifespan_allsubs_seg_index_ses_negcorrs' neg_corrs '_'↙
atlas '.mat']);
OA_vol_zero = OA_vol_zero.ses_SI;
% these are the segregation indices for young adults
YA_vol_zero = load([data_dir 'iNetworks_allsubs_seg_index_ses_negcorrs' neg_corrs '_'↙
atlas '.mat']);
YA_vol_zero = YA_vol_zero.ses_SI;
%% load the next batch
neg_corrs = 'nan'; % choose: 'nan', 'zero', 'asis'
atlas = 'Seitzman300'; % 'Seitzman300' or 'Parcels333'
%% load all the files
% these are the TimeB segregation indices for older adults
OA_vol_nan = load([data_dir 'Lifespan_allsubs_seg_index_ses_negcorrs' neg_corrs '_' atlas↙
'.mat']);
OA_vol_nan = OA_vol_nan.ses_SI;
% these are the segregation indices for young adults
YA_vol_nan = load([data_dir 'iNetworks_allsubs_seg_index_ses_negcorrs' neg_corrs '_'↙
atlas '.mat']);
YA_vol_nan = YA_vol_nan.ses_SI;
%% load the first batch
```

```
neg_corrs = 'asis'; % choose: 'nan', 'zero', 'asis'
atlas = 'Parcels333'; % 'Seitzman300' or 'Parcels333'
%% load all the files
% these are the TimeB segregation indices for older adults
OA_surf_asis = load([data_dir 'Lifespan_allsubs_seg_index_ses_negcorrs' neg_corrs '_'↙
atlas '.mat']);
OA_surf_asis = OA_surf_asis.ses_SI;
% these are the segregation indices for young adults
YA_surf_asis = load([data_dir 'iNetworks_allsubs_seg_index_ses_negcorrs' neg_corrs '_'↙
atlas '.mat']);
YA_surf_asis = YA_surf_asis.ses_SI;
%% load the next batch
neg_corrs = 'zero'; % choose: 'nan', 'zero', 'asis'
atlas = 'Parcels333'; % 'Seitzman300' or 'Parcels333'
%% load all the files
% these are the TimeB segregation indices for older adults
OA_surf_zero = load([data_dir 'Lifespan_allsubs_seg_index_ses_negcorrs' neg_corrs '_'↙
atlas '.mat']);
OA_surf_zero = OA_surf_zero.ses_SI;
% these are the segregation indices for young adults
YA_surf_zero = load([data_dir 'iNetworks_allsubs_seg_index_ses_negcorrs' neg_corrs '_'↙
atlas '.mat']);
YA_surf_zero = YA_surf_zero.ses_SI;
%% load the next batch
neg_corrs = 'nan'; % choose: 'nan', 'zero', 'asis'
atlas = 'Parcels'; % 'Seitzman300' or 'Parcels333'
%% load all the files
% these are the TimeB segregation indices for older adults
OA_surf_nan = load([data_dir 'Lifespan_allsubs_seg_index_ses_negcorrs' neg_corrs '_'↙
atlas '.mat']);
OA_surf_nan = OA_surf_nan.ses_SI;
% these are the segregation indices for young adults
YA_surf_nan = load([data_dir 'iNetworks_allsubs_seg_index_ses_negcorrs' neg_corrs '_'↙
atlas '.mat']);
YA_surf_nan = YA_surf_nan.ses_SI;
neg_corrs = 'nan'; % choose: 'nan', 'zero', 'asis'
atlas = 'Parcels333'; % 'Seitzman300' or 'Parcels333'
%% load all the files
% these are the TimeB segregation indices for older adults
OA_surf_nan = load([data_dir 'Lifespan_allsubs_seg_index_ses_negcorrs' neg_corrs '_'↙
atlas '.mat']);
OA_surf_nan = OA_surf_nan.ses_SI;
% these are the segregation indices for young adults
YA_surf_nan = load([data_dir 'iNetworks_allsubs_seg_index_ses_negcorrs' neg_corrs '_'↙
atlas '.mat']);
YA_surf_nan = YA_surf_nan.ses_SI;
test = OA_surf_asis(:);
YA_surf_nan = YA_surf_nan.ses_SI(:);
YA_surf_nan(:) = YA_surf_nan.ses_SI(:);
YA_surf_nan(:) = YA_surf_nan.ses_SI;
YA_vol_zero = YA_vol_zero(:)
load('sub-LS03_infomap_conBensus_weighted_minsize400.mat')
clear all
load('sub-LS03_infomap_conBensus_weighted_minsize400.mat')
load('sub-LS02_infomap_conBensus_weighted_minsize400.mat')
tmp = ft_read_cifti_mod('/corrofcorr_allgrad_LR_subcort_smooth2.55.dtseries.nii');
tmp = ft_read_cifti_mod('corrofcorr_allgrad_LR_subcort_smooth2.55.dtseries.nii');
data = consen(brainstructure>0);
data = consen(tmp.brainstructure>0);
tmp.data = data;
```

```
ft_write_cifti_mod('/sub-LS02_infomap_conBensus_weighted_minsize400.dtseries.nii', tmp);
ft_write_cifti_mod('sub-LS02_infomap_conBensus_weighted_minsize400.dtseries.nii', tmp);
unique(tmp.brainstructure)
load('sub-LS03_infomap_conBensus_weighted_minsize400.mat')
data = consen(tmp.brainstructure>0);
tmp.data = data;
ft_write_cifti_mod('sub-LS03_infomap_conBensus_weighted_minsize400.dtseries.nii', tmp);
dlmread('rawassn.txt')
rawassn = ans;
data = rawassn(:,1);
data = data(tmp.brainstructure>0);
tmp.data = data;
ft_write_cifti_mod('test_raw_assn_col1.dtseries.nii', tmp);
data = rawassn(:,2);
data = data(tmp.brainstructure>0);
tmp.data = data;
ft_write_cifti_mod('test_raw_assn_col2.dtseries.nii', tmp);
data = rawassn(:,3);
data = data(tmp.brainstructure>0);
tmp.data = data;
ft_write_cifti_mod('test_raw_assn_col3.dtseries.nii', tmp);
data = rawassn(:,4);
data = data(tmp.brainstructure>0);
tmp.data = data;
ft_write_cifti_mod('test_raw_assn_col4.dtseries.nii', tmp);
data = rawassn(:,5);
data = data(tmp.brainstructure>0);
tmp.data = data;
ft_write_cifti_mod('test_raw_assn_col5.dtseries.nii', tmp);
data = rawassn(:,6);
data = data(tmp.brainstructure>0);
tmp.data = data;
ft_write_cifti_mod('test_raw_assn_col6.dtseries.nii', tmp);
data = rawassn(:,7);
data = data(tmp.brainstructure>0);
tmp.data = data;
ft_write_cifti_mod('test_raw_assn_col7.dtseries.nii', tmp);
data = rawassn(:,8);
data = data(tmp.brainstructure>0);
tmp.data = data;
ft_write_cifti_mod('test_raw_assn_col8.dtseries.nii', tmp);
data = rawassn(:,9);
data = data(tmp.brainstructure>0);
tmp.data = data;
ft_write_cifti_mod('test_raw_assn_col9.dtseries.nii', tmp);
data = rawassn(:,10);
data = data(tmp.brainstructure>0);
tmp.data = data;
ft_write_cifti_mod('test_raw_assn_col10.dtseries.nii', tmp);
data = rawassn(:,11);
data = data(tmp.brainstructure>0);
tmp.data = data;
ft_write_cifti_mod('test_raw_assn_col11.dtseries.nii', tmp);
data = rawassn(:,12);
data = data(tmp.brainstructure>0);
tmp.data = data;
ft_write_cifti_mod('test_raw_assn_col12.dtseries.nii', tmp);
clear all
%% some paths
data_dir = '/Users/dianaperez/Desktop/Research/Segregation_Analyses/';
```

```
output_dir = '/Users/dianaperez/Desktop/Research/Segregation_Analyses/';
%% some variables
% I don't think I'll need these, but just in case
subs = {'LS02', 'LS03', 'LS05', 'LS08', 'LS11', 'LS14',↙
'LS16','LS17','INET001','INET002',↙
'INET003','INET005','INET006','INET010','INET016','INET018','INET019','INET030'};
rgb_colors = {[1 0 0], [0, 0, 1]};% red and blue
%% first load the first batch
neg_corrs = 'asis'; % choose: 'nan', 'zero', 'asis'
atlas = 'Seitzman300'; % 'Seitzman300' or 'Parcels333'
%% load all the files
% these are the TimeB segregation indices for older adults
OA_vol_asis = load([data_dir 'Lifespan_allsubs_seg_index_ses_negcorrs' neg_corrs '_'↙
atlas '.mat']);
OA_vol_asis = OA_vol_asis.ses_SI;
OA_vol_asis = OA_vol_asis(:);
% these are the segregation indices for young adults
YA_vol_asis = load([data_dir 'iNetworks_allsubs_seg_index_ses_negcorrs' neg_corrs '_'↙
atlas '.mat']);
YA_vol_asis = YA_vol_asis.ses_SI;
YA_vol_asis = YA_vol_asis(:);
%% load the next batch
neg_corrs = 'zero'; % choose: 'nan', 'zero', 'asis'
atlas = 'Seitzman300'; % 'Seitzman300' or 'Parcels333'
%% load all the files
% these are the TimeB segregation indices for older adults
OA_vol_zero = load([data_dir 'Lifespan_allsubs_seg_index_ses_negcorrs' neg_corrs '_'↙
atlas '.mat']);
OA_vol_zero = OA_vol_zero.ses_SI;
OA_vol_zero = OA_vol_zero(:);
% these are the segregation indices for young adults
YA_vol_zero = load([data_dir 'iNetworks_allsubs_seg_index_ses_negcorrs' neg_corrs '_'↙
atlas '.mat']);
YA_vol_zero = YA_vol_zero.ses_SI;
YA_vol_zero = YA_vol_zero(:);
%% load the next batch
neg_corrs = 'nan'; % choose: 'nan', 'zero', 'asis'
atlas = 'Seitzman300'; % 'Seitzman300' or 'Parcels333'
%% load all the files
% these are the TimeB segregation indices for older adults
OA_vol_nan = load([data_dir 'Lifespan_allsubs_seg_index_ses_negcorrs' neg_corrs '_' atlas↙
'.mat']);
OA_vol_nan = OA_vol_nan.ses_SI;
OA_vol_nan = OA_vol_nan(:);
% these are the segregation indices for young adults
YA_vol_nan = load([data_dir 'iNetworks_allsubs_seg_index_ses_negcorrs' neg_corrs '_'↙
atlas '.mat']);
YA_vol_nan = YA_vol_nan.ses_SI;
YA_vol_nan = YA_vol_nan(:);
%% load the first batch
neg_corrs = 'asis'; % choose: 'nan', 'zero', 'asis'
atlas = 'Parcels333'; % 'Seitzman300' or 'Parcels333'
%% load all the files
% these are the TimeB segregation indices for older adults
OA_surf_asis = load([data_dir 'Lifespan_allsubs_seg_index_ses_negcorrs' neg_corrs '_'↙
atlas '.mat']);
OA_surf_asis = OA_surf_asis.ses_SI;
OA_surf_asis = OA_surf_asis(:);
% these are the segregation indices for young adults
YA_surf_asis = load([data_dir 'iNetworks_allsubs_seg_index_ses_negcorrs' neg_corrs '_'↙
```

```
atlas '.mat']);
YA_surf_asis = YA_surf_asis.ses_SI;
YA_surf_asis = YA_surf_asis(:);
%% load the next batch
neg_corrs = 'zero'; % choose: 'nan', 'zero', 'asis'
atlas = 'Parcels333'; % 'Seitzman300' or 'Parcels333'
%% load all the files
% these are the TimeB segregation indices for older adults
OA_surf_zero = load([data_dir 'Lifespan_allsubs_seg_index_ses_negcorrs' neg_corrs '_'↙
atlas '.mat']);
OA_surf_zero = OA_surf_zero.ses_SI;
OA_surf_zero = OA_surf_zero(:);
% these are the segregation indices for young adults
YA_surf_zero = load([data_dir 'iNetworks_allsubs_seg_index_ses_negcorrs' neg_corrs '_'↙
atlas '.mat']);
YA_surf_zero = YA_surf_zero.ses_SI;
YA_surf_zero = YA_surf_zero(:);
%% load the next batch
neg_corrs = 'nan'; % choose: 'nan', 'zero', 'asis'
atlas = 'Parcels333'; % 'Seitzman300' or 'Parcels333'
%% load all the files
% these are the TimeB segregation indices for older adults
OA_surf_nan = load([data_dir 'Lifespan_allsubs_seg_index_ses_negcorrs' neg_corrs '_'↙
atlas '.mat']);
OA_surf_nan = OA_surf_nan.ses_SI;
OA_surf_nan = OA_surf_nan(:);
% these are the segregation indices for young adults
YA_surf_nan = load([data_dir 'iNetworks_allsubs_seg_index_ses_negcorrs' neg_corrs '_'↙
atlas '.mat']);
YA_surf_nan = YA_surf_nan.ses_SI(:);
YA_surf_nan = YA_surf_nan(:);
%% Now how do I plot these?
OA_surf = [OA_surf_asis; OA_surf_zero; OA_surf_nan];
OA_vol = [OA_vol_asis; OA_vol_zero; OA_vol_nan];
YA_surf = [YA_surf_asis; YA_surf_zero; YA_surf_nan];
YA_vol = [YA_vol_asis; YA_vol_zero; YA_vol_nan];
handles = plotSpread([OA_surf_asis OA_vol_asis], 'distributionMarkers', {'o'},↙
'distributionColors', [0,0,1], 'binWidth', .5);
close all
handles = plotSpread_v2([OA_surf_asis OA_vol_asis], 'distributionMarkers', {'o'},↙
'distributionColors', [0,0,1], 'binWidth', .5);
hold on
close all
handles = plotSpread([OA_surf_asis OA_vol_asis], 'distributionMarkers', {'o'},↙
'distributionColors', [0,0,1], 'binWidth', .5);
hold on
handles = plotSpread([YA_surf_asis YA_vol_asis], 'distributionMarkers', {'o'},↙
'distributionColors', [1,0,0], 'binWidth', .5);
hold on
clear all
handles = plotSpread([OA_surf_asis OA_vol_asis], 'distributionMarkers', {'+'},↙
'distributionColors', [0,0,1], 'binWidth', .5);
hold on
handles = plotSpread([YA_surf_asis YA_vol_asis], 'distributionMarkers', {'+'},↙
'distributionColors', [1,0,0], 'binWidth', .5);
hold on
handles = plotSpread([OA_surf_zero OA_vol_zero], 'distributionMarkers', {'o'},↙
'distributionColors', [0,0,1], 'binWidth', .5);
hold on
handles = plotSpread([YA_surf_zero YA_vol_zero], 'distributionMarkers', {'o'},↙
```

```
'distributionColors', [1,0,0], 'binWidth', .5);
hold on
handles = plotSpread([OA_surf_nan OA_vol_nan], 'distributionMarkers', {'*'},↙
'distributionColors', [0,0,1], 'binWidth', .5);
hold on
handles = plotSpread([YA_surf_nan YA_vol_nan], 'distributionMarkers', {'*'},↙
'distributionColors', [1,0,0], 'binWidth', .5);
hold on
%% some variables
% I don't think I'll need these, but just in case
subs = {'LS02', 'LS03', 'LS05', 'LS08', 'LS11', 'LS14',↙
'LS16','LS17','INET001','INET002',↙
'INET003','INET005','INET006','INET010','INET016','INET018','INET019','INET030'};
rgb_colors = {[1 0 0], [0, 0, 1]};% red and blue
%% first load the first batch
neg_corrs = 'asis'; % choose: 'nan', 'zero', 'asis'
atlas = 'Seitzman300'; % 'Seitzman300' or 'Parcels333'
%% load all the files
% these are the TimeB segregation indices for older adults
OA_vol_asis = load([data_dir 'Lifespan_allsubs_seg_index_ses_negcorrs' neg_corrs '_'↙
atlas '.mat']);
OA_vol_asis = OA_vol_asis.ses_SI;
OA_vol_asis = OA_vol_asis(:);
% these are the segregation indices for young adults
YA_vol_asis = load([data_dir 'iNetworks_allsubs_seg_index_ses_negcorrs' neg_corrs '_'↙
atlas '.mat']);
YA_vol_asis = YA_vol_asis.ses_SI;
YA_vol_asis = YA_vol_asis(:);
%% load the next batch
neg_corrs = 'zero'; % choose: 'nan', 'zero', 'asis'
atlas = 'Seitzman300'; % 'Seitzman300' or 'Parcels333'
%% load all the files
% these are the TimeB segregation indices for older adults
OA_vol_zero = load([data_dir 'Lifespan_allsubs_seg_index_ses_negcorrs' neg_corrs '_'↙
atlas '.mat']);
OA_vol_zero = OA_vol_zero.ses_SI;
OA_vol_zero = OA_vol_zero(:);
% these are the segregation indices for young adults
YA_vol_zero = load([data_dir 'iNetworks_allsubs_seg_index_ses_negcorrs' neg_corrs '_'↙
atlas '.mat']);
YA_vol_zero = YA_vol_zero.ses_SI;
YA_vol_zero = YA_vol_zero(:);
%% load the next batch
neg_corrs = 'nan'; % choose: 'nan', 'zero', 'asis'
atlas = 'Seitzman300'; % 'Seitzman300' or 'Parcels333'
%% load all the files
% these are the TimeB segregation indices for older adults
OA_vol_nan = load([data_dir 'Lifespan_allsubs_seg_index_ses_negcorrs' neg_corrs '_' atlas↙
'.mat']);
OA_vol_nan = OA_vol_nan.ses_SI;
OA_vol_nan = OA_vol_nan(:);
% these are the segregation indices for young adults
YA_vol_nan = load([data_dir 'iNetworks_allsubs_seg_index_ses_negcorrs' neg_corrs '_'↙
atlas '.mat']);
YA_vol_nan = YA_vol_nan.ses_SI;
YA_vol_nan = YA_vol_nan(:);
%% load the first batch
neg_corrs = 'asis'; % choose: 'nan', 'zero', 'asis'
atlas = 'Parcels333'; % 'Seitzman300' or 'Parcels333'
%% load all the files
```

```
% these are the TimeB segregation indices for older adults
OA_surf_asis = load([data_dir 'Lifespan_allsubs_seg_index_ses_negcorrs' neg_corrs '_'↙
atlas '.mat']);
OA_surf_asis = OA_surf_asis.ses_SI;
OA_surf_asis = OA_surf_asis(:);
% these are the segregation indices for young adults
YA_surf_asis = load([data_dir 'iNetworks_allsubs_seg_index_ses_negcorrs' neg_corrs '_'↙
atlas '.mat']);
YA_surf_asis = YA_surf_asis.ses_SI;
YA_surf_asis = YA_surf_asis(:);
%% load the next batch
neg_corrs = 'zero'; % choose: 'nan', 'zero', 'asis'
atlas = 'Parcels333'; % 'Seitzman300' or 'Parcels333'
%% load all the files
% these are the TimeB segregation indices for older adults
OA_surf_zero = load([data_dir 'Lifespan_allsubs_seg_index_ses_negcorrs' neg_corrs '_'↙
atlas '.mat']);
OA_surf_zero = OA_surf_zero.ses_SI;
OA_surf_zero = OA_surf_zero(:);
% these are the segregation indices for young adults
YA_surf_zero = load([data_dir 'iNetworks_allsubs_seg_index_ses_negcorrs' neg_corrs '_'↙
atlas '.mat']);
YA_surf_zero = YA_surf_zero.ses_SI;
YA_surf_zero = YA_surf_zero(:);
%% load the next batch
neg_corrs = 'nan'; % choose: 'nan', 'zero', 'asis'
atlas = 'Parcels333'; % 'Seitzman300' or 'Parcels333'
%% load all the files
% these are the TimeB segregation indices for older adults
OA_surf_nan = load([data_dir 'Lifespan_allsubs_seg_index_ses_negcorrs' neg_corrs '_'↙
atlas '.mat']);
OA_surf_nan = OA_surf_nan.ses_SI;
OA_surf_nan = OA_surf_nan(:);
% these are the segregation indices for young adults
YA_surf_nan = load([data_dir 'iNetworks_allsubs_seg_index_ses_negcorrs' neg_corrs '_'↙
atlas '.mat']);
YA_surf_nan = YA_surf_nan.ses_SI(:);
YA_surf_nan = YA_surf_nan(:);
%% Now how do I plot these?
handles = plotSpread([OA_surf_asis OA_vol_asis], 'distributionMarkers', {'+'},↙
'distributionColors', [0,0,1], 'binWidth', .5);
hold on
handles = plotSpread([YA_surf_asis YA_vol_asis], 'distributionMarkers', {'+'},↙
'distributionColors', [1,0,0], 'binWidth', .5);
hold on
handles = plotSpread([OA_surf_zero OA_vol_zero], 'distributionMarkers', {'o'},↙
'distributionColors', [0,0,1], 'binWidth', .5);
hold on
handles = plotSpread([YA_surf_zero YA_vol_zero], 'distributionMarkers', {'o'},↙
'distributionColors', [1,0,0], 'binWidth', .5);
hold on
handles = plotSpread([OA_surf_nan OA_vol_nan], 'distributionMarkers', {'*'},↙
'distributionColors', [0,0,1], 'binWidth', .5);
hold on
handles = plotSpread([YA_surf_nan YA_vol_nan], 'distributionMarkers', {'*'},↙
'distributionColors', [1,0,0], 'binWidth', .5);
hold on
data_dir = '/Users/dianaperez/Desktop/Research/Segregation_Analyses/';
output_dir = '/Users/dianaperez/Desktop/Research/Segregation_Analyses/';
%% some variables
```

```
% I don't think I'll need these, but just in case
subs = {'LS02', 'LS03', 'LS05', 'LS08', 'LS11', 'LS14',↙
'LS16','LS17','INET001','INET002',↙
'INET003','INET005','INET006','INET010','INET016','INET018','INET019','INET030'};
rgb_colors = {[1 0 0], [0, 0, 1]};% red and blue
%% first load the first batch
neg_corrs = 'asis'; % choose: 'nan', 'zero', 'asis'
atlas = 'Seitzman300'; % 'Seitzman300' or 'Parcels333'
%% load all the files
% these are the TimeB segregation indices for older adults
OA_vol_asis = load([data_dir 'Lifespan_allsubs_seg_index_ses_negcorrs' neg_corrs '_'↙
atlas '.mat']);
OA_vol_asis = OA_vol_asis.ses_SI;
OA_vol_asis = OA_vol_asis(:);
% these are the segregation indices for young adults
YA_vol_asis = load([data_dir 'iNetworks_allsubs_seg_index_ses_negcorrs' neg_corrs '_'↙
atlas '.mat']);
YA_vol_asis = YA_vol_asis.ses_SI;
YA_vol_asis = YA_vol_asis(:);
%% load the next batch
neg_corrs = 'zero'; % choose: 'nan', 'zero', 'asis'
atlas = 'Seitzman300'; % 'Seitzman300' or 'Parcels333'
%% load all the files
% these are the TimeB segregation indices for older adults
OA_vol_zero = load([data_dir 'Lifespan_allsubs_seg_index_ses_negcorrs' neg_corrs '_'↙
atlas '.mat']);
OA_vol_zero = OA_vol_zero.ses_SI;
OA_vol_zero = OA_vol_zero(:);
% these are the segregation indices for young adults
YA_vol_zero = load([data_dir 'iNetworks_allsubs_seg_index_ses_negcorrs' neg_corrs '_'↙
atlas '.mat']);
YA_vol_zero = YA_vol_zero.ses_SI;
YA_vol_zero = YA_vol_zero(:);
%% load the next batch
neg_corrs = 'nan'; % choose: 'nan', 'zero', 'asis'
atlas = 'Seitzman300'; % 'Seitzman300' or 'Parcels333'
%% load all the files
% these are the TimeB segregation indices for older adults
OA_vol_nan = load([data_dir 'Lifespan_allsubs_seg_index_ses_negcorrs' neg_corrs '_' atlas↙
'.mat']);
OA_vol_nan = OA_vol_nan.ses_SI;
OA_vol_nan = OA_vol_nan(:);
% these are the segregation indices for young adults
YA_vol_nan = load([data_dir 'iNetworks_allsubs_seg_index_ses_negcorrs' neg_corrs '_'↙
atlas '.mat']);
YA_vol_nan = YA_vol_nan.ses_SI;
YA_vol_nan = YA_vol_nan(:);
%% load the first batch
neg_corrs = 'asis'; % choose: 'nan', 'zero', 'asis'
atlas = 'Parcels333'; % 'Seitzman300' or 'Parcels333'
%% load all the files
% these are the TimeB segregation indices for older adults
OA_surf_asis = load([data_dir 'Lifespan_allsubs_seg_index_ses_negcorrs' neg_corrs '_'↙
atlas '.mat']);
OA_surf_asis = OA_surf_asis.ses_SI;
OA_surf_asis = OA_surf_asis(:);
% these are the segregation indices for young adults
YA_surf_asis = load([data_dir 'iNetworks_allsubs_seg_index_ses_negcorrs' neg_corrs '_'↙
atlas '.mat']);
YA_surf_asis = YA_surf_asis.ses_SI;
```

```
YA_surf_asis = YA_surf_asis(:);
%% load the next batch
neg_corrs = 'zero'; % choose: 'nan', 'zero', 'asis'
atlas = 'Parcels333'; % 'Seitzman300' or 'Parcels333'
%% load all the files
% these are the TimeB segregation indices for older adults
OA_surf_zero = load([data_dir 'Lifespan_allsubs_seg_index_ses_negcorrs' neg_corrs '_'↙
atlas '.mat']);
OA_surf_zero = OA_surf_zero.ses_SI;
OA_surf_zero = OA_surf_zero(:);
% these are the segregation indices for young adults
YA_surf_zero = load([data_dir 'iNetworks_allsubs_seg_index_ses_negcorrs' neg_corrs '_'↙
atlas '.mat']);
YA_surf_zero = YA_surf_zero.ses_SI;
YA_surf_zero = YA_surf_zero(:);
%% load the next batch
neg_corrs = 'nan'; % choose: 'nan', 'zero', 'asis'
atlas = 'Parcels333'; % 'Seitzman300' or 'Parcels333'
%% load all the files
% these are the TimeB segregation indices for older adults
OA_surf_nan = load([data_dir 'Lifespan_allsubs_seg_index_ses_negcorrs' neg_corrs '_'↙
atlas '.mat']);
OA_surf_nan = OA_surf_nan.ses_SI;
OA_surf_nan = OA_surf_nan(:);
% these are the segregation indices for young adults
YA_surf_nan = load([data_dir 'iNetworks_allsubs_seg_index_ses_negcorrs' neg_corrs '_'↙
atlas '.mat']);
YA_surf_nan = YA_surf_nan.ses_SI(:);
YA_surf_nan = YA_surf_nan(:);
%% Now how do I plot these?
handles = plotSpread([OA_surf_asis OA_vol_asis], 'distributionMarkers', {'+'},↙
'distributionColors', [0,0,1], 'binWidth', .5);
hold on
handles = plotSpread([YA_surf_asis YA_vol_asis], 'distributionMarkers', {'+'},↙
'distributionColors', [1,0,0], 'binWidth', .5);
hold on
handles = plotSpread([OA_surf_zero OA_vol_zero], 'distributionMarkers', {'o'},↙
'distributionColors', [0,0,1], 'binWidth', .5);
hold on
handles = plotSpread([YA_surf_zero YA_vol_zero], 'distributionMarkers', {'o'},↙
'distributionColors', [1,0,0], 'binWidth', .5);
hold on
handles = plotSpread([OA_surf_nan OA_vol_nan], 'distributionMarkers', {'*'},↙
'distributionColors', [0,0,1], 'binWidth', .5);
hold on
handles = plotSpread([YA_surf_nan YA_vol_nan], 'distributionMarkers', {'*'},↙
'distributionColors', [1,0,0], 'binWidth', .5);
hold on
close all
data_dir = '/Users/dianaperez/Desktop/Research/Segregation_Analyses/';
output_dir = '/Users/dianaperez/Desktop/Research/Segregation_Analyses/';
%% some variables
% I don't think I'll need these, but just in case
subs = {'LS02', 'LS03', 'LS05', 'LS08', 'LS11', 'LS14',↙
'LS16','LS17','INET001','INET002',↙
'INET003','INET005','INET006','INET010','INET016','INET018','INET019','INET030'};
rgb_colors = {[1 0 0], [0, 0, 1]};% red and blue
%% first load the first batch
neg_corrs = 'asis'; % choose: 'nan', 'zero', 'asis'
atlas = 'Seitzman300'; % 'Seitzman300' or 'Parcels333'
```

```
%% load all the files
% these are the TimeB segregation indices for older adults
OA_vol_asis = load([data_dir 'Lifespan_allsubs_seg_index_ses_negcorrs' neg_corrs '_'↙
atlas '.mat']);
OA_vol_asis = OA_vol_asis.ses_SI;
OA_vol_asis = OA_vol_asis(:);
% these are the segregation indices for young adults
YA_vol_asis = load([data_dir 'iNetworks_allsubs_seg_index_ses_negcorrs' neg_corrs '_'↙
atlas '.mat']);
YA_vol_asis = YA_vol_asis.ses_SI;
YA_vol_asis = YA_vol_asis(:);
%% load the next batch
neg_corrs = 'zero'; % choose: 'nan', 'zero', 'asis'
atlas = 'Seitzman300'; % 'Seitzman300' or 'Parcels333'
%% load all the files
% these are the TimeB segregation indices for older adults
OA_vol_zero = load([data_dir 'Lifespan_allsubs_seg_index_ses_negcorrs' neg_corrs '_'↙
atlas '.mat']);
OA_vol_zero = OA_vol_zero.ses_SI;
OA_vol_zero = OA_vol_zero(:);
% these are the segregation indices for young adults
YA_vol_zero = load([data_dir 'iNetworks_allsubs_seg_index_ses_negcorrs' neg_corrs '_'↙
atlas '.mat']);
YA_vol_zero = YA_vol_zero.ses_SI;
YA_vol_zero = YA_vol_zero(:);
%% load the next batch
neg_corrs = 'nan'; % choose: 'nan', 'zero', 'asis'
atlas = 'Seitzman300'; % 'Seitzman300' or 'Parcels333'
%% load all the files
% these are the TimeB segregation indices for older adults
OA_vol_nan = load([data_dir 'Lifespan_allsubs_seg_index_ses_negcorrs' neg_corrs '_' atlas↙
'.mat']);
OA_vol_nan = OA_vol_nan.ses_SI;
OA_vol_nan = OA_vol_nan(:);
% these are the segregation indices for young adults
YA_vol_nan = load([data_dir 'iNetworks_allsubs_seg_index_ses_negcorrs' neg_corrs '_'↙
atlas '.mat']);
YA_vol_nan = YA_vol_nan.ses_SI;
YA_vol_nan = YA_vol_nan(:);
%% load the first batch
neg_corrs = 'asis'; % choose: 'nan', 'zero', 'asis'
atlas = 'Parcels333'; % 'Seitzman300' or 'Parcels333'
%% load all the files
% these are the TimeB segregation indices for older adults
OA_surf_asis = load([data_dir 'Lifespan_allsubs_seg_index_ses_negcorrs' neg_corrs '_'↙
atlas '.mat']);
OA_surf_asis = OA_surf_asis.ses_SI;
OA_surf_asis = OA_surf_asis(:);
% these are the segregation indices for young adults
YA_surf_asis = load([data_dir 'iNetworks_allsubs_seg_index_ses_negcorrs' neg_corrs '_'↙
atlas '.mat']);
YA_surf_asis = YA_surf_asis.ses_SI;
YA_surf_asis = YA_surf_asis(:);
%% load the next batch
neg_corrs = 'zero'; % choose: 'nan', 'zero', 'asis'
atlas = 'Parcels333'; % 'Seitzman300' or 'Parcels333'
%% load all the files
% these are the TimeB segregation indices for older adults
OA_surf_zero = load([data_dir 'Lifespan_allsubs_seg_index_ses_negcorrs' neg_corrs '_'↙
atlas '.mat']);
```

```
OA_surf_zero = OA_surf_zero.ses_SI;
OA_surf_zero = OA_surf_zero(:);
% these are the segregation indices for young adults
YA_surf_zero = load([data_dir 'iNetworks_allsubs_seg_index_ses_negcorrs' neg_corrs '_'↙
atlas '.mat']);
YA_surf_zero = YA_surf_zero.ses_SI;
YA_surf_zero = YA_surf_zero(:);
%% load the next batch
neg_corrs = 'nan'; % choose: 'nan', 'zero', 'asis'
atlas = 'Parcels333'; % 'Seitzman300' or 'Parcels333'
%% load all the files
% these are the TimeB segregation indices for older adults
OA_surf_nan = load([data_dir 'Lifespan_allsubs_seg_index_ses_negcorrs' neg_corrs '_'↙
atlas '.mat']);
OA_surf_nan = OA_surf_nan.ses_SI;
OA_surf_nan = OA_surf_nan(:);
% these are the segregation indices for young adults
YA_surf_nan = load([data_dir 'iNetworks_allsubs_seg_index_ses_negcorrs' neg_corrs '_'↙
atlas '.mat']);
YA_surf_nan = YA_surf_nan.ses_SI(:);
YA_surf_nan = YA_surf_nan(:);
%% Now how do I plot these?
handles = plotSpread([OA_surf_asis OA_vol_asis], 'distributionMarkers', {'+'},↙
'distributionColors', [0,0,1], 'binWidth', .5);
hold on
handles = plotSpread([YA_surf_asis YA_vol_asis], 'distributionMarkers', {'+'},↙
'distributionColors', [1,0,0], 'binWidth', .5);
hold on
handles = plotSpread([OA_surf_zero OA_vol_zero], 'distributionMarkers', {'o'},↙
'distributionColors', [0,0,1], 'binWidth', .5);
hold on
handles = plotSpread([YA_surf_zero YA_vol_zero], 'distributionMarkers', {'o'},↙
'distributionColors', [1,0,0], 'binWidth', .5);
hold on
handles = plotSpread([OA_surf_nan OA_vol_nan], 'distributionMarkers', {'*'},↙
'distributionColors', [0,0,1], 'binWidth', .5);
hold on
handles = plotSpread([YA_surf_nan YA_vol_nan], 'distributionMarkers', {'*'},↙
'distributionColors', [1,0,0], 'binWidth', .5);
hold on
segregation_ind_split_fist_ses
matched_data_1 = matched_data_sorted(:,1:amt_data);
matched_data_2 = matched_data_sorted(:,end-amt_data:end);
matched_data_2 = matched_data_sorted(:,end-amt_data-1:end);
matched_data_2 = matched_data_sorted(:,end-amt_data+1:end);
segregation_ind_split_fist_ses
load([output_dir '_allsubs_seg_index_splitfirstses_negcorrs' neg_corrs '_' atlas '.mat'])
load([output_dir data_set '_allsubs_seg_index_splitfirstses_negcorrs' neg_corrs '_' atlas↙
'.mat'])
rgb_colors = [1 0 0;%LS02
0, 1, 0;%LS03
0, 0, 1;%LS05
0, 1, 1;%LS08
1, 0, 1;%LS11
0.4660 0.6740 0.188;%LS14
0.9290 0.6940 0.1250;%LS16
0.4940 0.1840 0.5560];%LS17
subs = {'LS02', 'LS03', 'LS05', 'LS08', 'LS11', 'LS14', 'LS16','LS17'};
for n = 1:numel(subs)
rgb_for_plot{n} = rgb_colors(n,:);
```

```
end
handles = plotSpread_v2(ses_SI', 'distributionMarkers', {'o'}, 'distributionColors',↙
rgb_for_plot', 'xNames', subs, 'binWidth', 1);
hold on
close all
handles = plotSpread_v2(ses_SI', 'distributionMarkers', {'o'}, 'distributionColors',↙
rgb_for_plot', 'xNames', subs, 'binWidth', 1);
rgb_colors = [0 0 0;
0 0 0;
1 1 1;
0 0 0;
0 0 0;
0 0 0;
0 0 0;
0 0 0];
for n = 1:numel(subs)
rgb_for_plot{n} = rgb_colors(n,:);
end
handles = plotSpread(ses_SI', 'distributionMarkers', {'o'}, 'distributionColors',↙
rgb_for_plot', 'xNames', subs, 'binWidth', 1);
clear all
parcels = ft_read_cifti_mod('/Users/dianaperez/Desktop/parcellations/sub-↙
LS02/lifespan_individual_parcels_edgethresh_0.5.dtseries.nii')
ft_read_cifti_mod('lifespan_individual_parcels_edgethresh_0.5.dtseries.nii')
load('label.mat')
template = ft_read_cifti_mod('/Users/dianaperez/Desktop/sub-↙
LS03_infomap_conBensus_weighted_minsize400.dtseries.nii')
template.data = label;
ft_write_cifti_mod('/Users/dianaperez/Desktop/sub-LS02_individual_parcels.dtseries.nii',↙
template);
raw_assn = dlmread('/Users/dianaperez/Desktop/rawassn.txt');
data = raw_assn(:,1);
template.data = data;
ft_write_cifti_mod('/Users/dianaperez/Desktop/test_LS02_thresh1.dtseries.nii', template);
template.data = raw_assn(:,2);
ft_write_cifti_mod('/Users/dianaperez/Desktop/test_LS02_thresh2.dtseries.nii', template);
template.data = raw_assn(:,12);
ft_write_cifti_mod('/Users/dianaperez/Desktop/test_LS02_thresh12.dtseries.nii',↙
template);
template.data = raw_assn(:,11);
ft_write_cifti_mod('/Users/dianaperez/Desktop/test_LS02_thresh11.dtseries.nii',↙
template);
load('sub-LS02_dice_to_templates.mat')
clear all
load('sub-LS02_dice_to_templates.mat')
help max
for vert = 1:59412
[M,I] = max(dice_to_templates(:,vert)); template_match(vert,1) = I;
end
template = ft_read_cifti_mod('/Users/dianaperez/Desktop/sub-↙
LS03_infomap_conBensus_weighted_minsize400.dtseries.nii')
template.data = template_match;
ft_write_cifti_mod('/Users/dianaperez/Desktop/sub_LS02_template_match_nets.dtseries.nii',↙
template);
colors = [1,1;2,2; 3,3; 4,5; 5,7; 6,8;7,9;8,10;9,11;10,12;,11,13;12,14;13,15;14,16];
outmat = raw2colors_mat(template_match, colors);
template.data = outmat;
ft_write_cifti_mod('/Users/dianaperez/Desktop/sub_LS02_template_match_nets.dtseries.nii',↙
template);
load('sub-LS03_dice_to_templates.mat')
```

```
for vert = 1:59412
[M,I] = max(dice_to_templates(:,vert));
template_match(vert,1) = I;
end
colors = [1,1;2,2; 3,3; 4,5; 5,7; 6,8;7,9;8,10;9,11;10,12;,11,13;12,14;13,15;14,16];
outmat = raw2colors_mat(template_match, colors);
template.data = outmat;
ft_write_cifti_mod('/Users/dianaperez/Desktop/sub_LS03_template_match_nets.dtseries.nii',↙
template);
clear all
uiopen('/Users/dianaperez/Desktop/Lifespan_parcellations/subsample_10/sub-LS02/sub-↙
LS02_individual_parcels_edgethresh_0.5.dtseries.nii',1)
ind_parcels = ft_read_cifti_mod↙
('/Users/dianaperez/Desktop/Lifespan_parcellations/subsample_10/sub-LS02/sub-↙
LS02_individual_parcels_edgethresh_0.5.dtseries.nii');
unique_ind_parc = unique(ind_parcels.data);
ind_parc = ind_parcels; clear ind_parcels
ind_parcels = ft_read_cifti_mod('sub-↙
LS02_infomap_conBensus_weighted_minsize20_consecutive_parcelopt.dtseries.nii');
post_infomap_proc
open conBensus.m
post_infomap_proc
%-- 4/12/23, 8:25 PM --%
help evalc
load('/Users/dianaperez/Desktop/Lifespan_parcellations/GordonParcellation/sub-LS05/sub-↙
LS05_corr_parcel_by_template_binarized.mat')
load('/Volumes/fsmresfiles/PBS/Gratton_Lab/Lifespan/seg_index/sub-↙
LS02_segregation_indices_by_net_indiv_parcs.mat')
clear all
load('/Volumes/fsmresfiles/PBS/Gratton_Lab/Lifespan/seg_index/sub-↙
LS02_segregation_indices_by_net_indiv_parcs.mat')
load('/Volumes/fsmresfiles/PBS/Gratton_Lab/Lifespan/seg_index/Lifespan_seg_index_by_sub.↙
mat')
clear all
similarity_analysis_main
similarity_analysis_by_system
addpath '/Users/dianaperez/Documents/GitHub/GrattonLab-General-Repo/FCProcess'
similarity_analysis_by_system
similarity_analysis_longitudinal
clear all
similarity_analysis_longitudinal
clear simmat
simmat = corr(corrlin);
simmat = corr(corrlin');
simmat = single(corr(corrlin'));
simmat_single = single(simmat)
similarity_analysis_longitudinal
%-- 4/20/23, 3:31 PM --%
load('/Users/dianaperez/Downloads/DartmouthMIND_tutorial-master/data/Parcel_params.mat')
ROI_params = {};
ROI_params.atlas = 'Seitzman300';
atlas_params = atlas_parameters_GrattonLab↙
('Seitzman300','/Volumes/fsmresfiles/PBS/Gratton_Lab/Atlases/')
ROI_params.networks = atlas_params.networks
ROI_params.networks = atlas_params.networks'
ROI_params.mods = atlas_params.mods'
ROI_params.mods = atlas_params.mods
ROI_params.mods_array = atlas_params.mods_array';
ROI_params.dist_thresh = atlas_params.dist_thresh;
ROI_params.num_rois = atlas_params.num_rois;
```

```
ROI_params.colors = atlas_params.colors;
ROI_params.sorti = atlas_params.sorti';
ROI_params.transitions = atlas_params.transitions';
ROI_params.centers = atlas_params.centers;
clear all
load('/Volumes/fsmresfiles/PBS/Gratton_Lab/Lifespan/Post-↙
COVID/BIDS/derivatives/preproc_FCProc/corrmats_Seitzman300/sub-LS02/sub-LS02_sess-1_task-↙
rest_corrmat_Seitzman300.mat')
corrmat_1 = corrmat;
load('/Volumes/fsmresfiles/PBS/Gratton_Lab/Lifespan/Post-↙
COVID/BIDS/derivatives/preproc_FCProc/corrmats_Seitzman300/sub-LS02/sub-LS02_sess-2_task-↙
rest_corrmat_Seitzman300.mat')
corrmat_2 = corrmat;
all_corrmat(:,:,1,2) = corrmat_1;
all_corrmat(:,:,1,1) = corrmat_2;
all_corrmat_2(:,1,1) = corrmat_1;
avg_corrmat = mean(all_corrmat);
avg_corrmat = squeeze(mean(all_corrmat));
avg_corrmat = squeeze(mean(all_corrmat(:,:,:)));
clear all
subs = {'LS02', 'LS03', 'LS05', 'LS08', 'LS11', 'LS14', 'LS16', 'LS17'};
sessions = 5;
corrmat_dir = '/Volumes/fsmresfiles/PBS/Gratton_Lab/Lifespan/Post-↙
COVID/BIDS/derivatives/preproc_FCProc/corrmats_Seitzman300/';
count = 1;
for sub = 1:numel(subs)
for ses = 1:sessions
% load the matrix
corrmat_fname = sprintf('%s/sub-%s/sub-%s_sess-%d_task-rest_corrmat_Seitzman300.mat',↙
corrmat_dir, subs{sub}, subs{s}, ses);
load(corrmat_fname)
all_corrmats(count,:,:,:) = corrmat;
count = count + 1;
end
end
subs = {'LS02', 'LS03', 'LS05', 'LS08', 'LS11', 'LS14', 'LS16', 'LS17'};
sessions = 5;
corrmat_dir = '/Volumes/fsmresfiles/PBS/Gratton_Lab/Lifespan/Post-↙
COVID/BIDS/derivatives/preproc_FCProc/corrmats_Seitzman300/';
count = 1;
for sub = 1:numel(subs)
for ses = 1:sessions
% load the matrix
corrmat_fname = sprintf('%s/sub-%s/sub-%s_sess-%d_task-rest_corrmat_Seitzman300.mat',↙
corrmat_dir, subs{sub}, subs{sub}, ses);
load(corrmat_fname)
all_corrmats(count,:,:,:) = corrmat;
count = count + 1;
end
end
mean_corrmat = squeeze(mean(all_corrmats));
imagesc(mean_corrmat,[-1 1])
atlas_params = atlas_parameters_GrattonLab↙
('Seitzman300','/Volumes/fsmresfiles/PBS/Gratton_Lab/Atlases/');
clear all_corrmats count corrmat corrmat_dir sess_roi*
clear tmask*
figure_corrmat_GrattonLab(mean_corrmat,atlas_params,-1,1);
close('all')
figure_corrmat_GrattonLab(mean_corrmat,atlas_params,-1,1);
addpath '/Users/dianaperez/Documents/GitHub/GrattonLab-General-Repo/FCProcess'
```

```
figure_corrmat_GrattonLab(mean_corrmat,atlas_params,-1,1);
clear all
dataset = 'Lifespan';
subs = {'LS02', 'LS03', 'LS05', 'LS08', 'LS11', 'LS14', 'LS16', 'LS17'};
sessions = 5;
corrmat_dir = '/Volumes/fsmresfiles/PBS/Gratton_Lab/Lifespan/Post-↙
COVID/BIDS/derivatives/preproc_FCProc/corrmats_Seitzman300/';
out_dir = '/Users/dianaperez/Desktop/';
fout_str = sprintf('%s/%s_average_correlation_matrix', out_dir, dataset);
count = 1;
for sub = 1:numel(subs)
for ses = 1:sessions
% load the matrix
corrmat_fname = sprintf('%s/sub-%s/sub-%s_sess-%d_task-rest_corrmat_Seitzman300.mat',↙
corrmat_dir, subs{sub}, subs{sub}, ses);
load(corrmat_fname)
all_corrmats(count,:,:,:) = corrmat;
count = count + 1;
end
end
%calculate mean
mean_corrmat = squeeze(mean(all_corrmats));
%clear some memory
clear all_corrmats count corrmat corrmat_dir sess_roi* tmask*
%load atlas parameters for plotting
atlas_params = atlas_parameters_GrattonLab↙
('Seitzman300','/Volumes/fsmresfiles/PBS/Gratton_Lab/Atlases/');
%plot mean correlation matrix
figure_corrmat_GrattonLab(mean_corrmat,atlas_params,-1,1);
%save mean correlation matrix image
saveas(gcf,[fout_str '.tiff'],'tiff');
close(gcf);
%save the corrmat data
save([fout_str '.mat'], 'mean_corrmat');
clear all
dataset = 'iNetworks';
if strcmpi(dataset, 'Lifespan')
subs = {'LS02', 'LS03', 'LS05', 'LS08', 'LS11', 'LS14', 'LS16', 'LS17'};
sessions = 5;
elseif strcmpi(dataset, 'iNetworks')
subs = {'INET001','INET002',↙
'INET003','INET005','INET006','INET010','INET016','INET018','INET019','INET030'};
sessions = 4;
end
corrmat_dir = '/Volumes/fsmresfiles/PBS/Gratton_Lab/Lifespan/Post-↙
COVID/BIDS/derivatives/preproc_FCProc/corrmats_Seitzman300/';
out_dir = '/Users/dianaperez/Desktop/';
fout_str = sprintf('%s/%s_average_correlation_matrix', out_dir, dataset);
count = 1;
for sub = 1:numel(subs)
for ses = 1:sessions
% load the matrix
corrmat_fname = sprintf('%s/sub-%s/sub-%s_sess-%d_task-rest_corrmat_Seitzman300.mat',↙
corrmat_dir, subs{sub}, subs{sub}, ses);
load(corrmat_fname)
all_corrmats(count,:,:,:) = corrmat;
count = count + 1;
end
end
%calculate mean
```

```
mean_corrmat = squeeze(mean(all_corrmats));
%clear some memory
clear all_corrmats count corrmat corrmat_dir sess_roi* tmask*
%load atlas parameters for plotting
atlas_params = atlas_parameters_GrattonLab↙
('Seitzman300','/Volumes/fsmresfiles/PBS/Gratton_Lab/Atlases/');
%plot mean correlation matrix
figure_corrmat_GrattonLab(mean_corrmat,atlas_params,-1,1);
%save mean correlation matrix image
saveas(gcf,[fout_str '.tiff'],'tiff');
close(gcf);
%save the corrmat data
save([fout_str '.mat'], 'mean_corrmat');
clear all
dataset = 'iNetworks';
if strcmpi(dataset, 'Lifespan')
subs = {'LS02', 'LS03', 'LS05', 'LS08', 'LS11', 'LS14', 'LS16', 'LS17'};
sessions = 5;
corrmat_dir = '/Volumes/fsmresfiles/PBS/Gratton_Lab/Lifespan/Post-↙
COVID/BIDS/derivatives/preproc_FCProc/corrmats_Seitzman300/';
elseif strcmpi(dataset, 'iNetworks')
subs = {'INET001','INET002',↙
'INET003','INET005','INET006','INET010','INET016','INET018','INET019','INET030'};
sessions = 4;
corrmat_dir =↙
'/Volumes/fsmresfiles/PBS/Gratton_Lab/Lifespan/Segregation_analyses/iNetworks/Nifti/deriv↙
atives/preproc_FCProc/corrmats_Seitzman300';
end
out_dir = '/Users/dianaperez/Desktop/';
fout_str = sprintf('%s/%s_average_correlation_matrix', out_dir, dataset);
count = 1;
for sub = 1:numel(subs)
for ses = 1:sessions
% load the matrix
corrmat_fname = sprintf('%s/sub-%s/sub-%s_sess-%d_task-rest_corrmat_Seitzman300.mat',↙
corrmat_dir, subs{sub}, subs{sub}, ses);
load(corrmat_fname)
all_corrmats(count,:,:,:) = corrmat;
count = count + 1;
end
end
%calculate mean
mean_corrmat = squeeze(mean(all_corrmats));
%clear some memory
clear all_corrmats count corrmat corrmat_dir sess_roi* tmask*
%load atlas parameters for plotting
atlas_params = atlas_parameters_GrattonLab↙
('Seitzman300','/Volumes/fsmresfiles/PBS/Gratton_Lab/Atlases/');
%plot mean correlation matrix
figure_corrmat_GrattonLab(mean_corrmat,atlas_params,-1,1);
%save mean correlation matrix image
saveas(gcf,[fout_str '.tiff'],'tiff');
close(gcf);
%save the corrmat data
save([fout_str '.mat'], 'mean_corrmat');
clear all
load('/Users/dianaperez/Desktop/Neurohackademy_Tutorial-↙
master/data/MSC02_333parcels_infomapassn.mat')
clear all
clear all
```

```
dataset = 'iNetworks';
if strcmpi(dataset, 'Lifespan')
subs = {'LS02', 'LS03', 'LS05', 'LS08', 'LS11', 'LS14', 'LS16', 'LS17'};
sessions = 5;
corrmat_dir = '/Volumes/fsmresfiles/PBS/Gratton_Lab/Lifespan/Post-↙
COVID/BIDS/derivatives/preproc_FCProc/corrmats_Seitzman300/';
elseif strcmpi(dataset, 'iNetworks')
subs = {'INET001','INET002',↙
'INET003','INET005','INET006','INET010','INET016','INET018','INET019','INET030'};
sessions = 4;
corrmat_dir =↙
'/Volumes/fsmresfiles/PBS/Gratton_Lab/Lifespan/Segregation_analyses/iNetworks/Nifti/deriv↙
atives/preproc_FCProc/corrmats_Seitzman300';
end
out_dir = '/Users/dianaperez/Desktop/';
fout_str = sprintf('%s/%s_average_correlation_matrix', out_dir, dataset);
count = 1;
for sub = 1:numel(subs)
for ses = 1:sessions
% load the matrix
corrmat_fname = sprintf('%s/sub-%s/sub-%s_sess-%d_task-rest_corrmat_Seitzman300.mat',↙
corrmat_dir, subs{sub}, subs{sub}, ses);
load(corrmat_fname)
all_corrmats(count,:,:,:) = corrmat;
sub_corrmat(ses,:,:,:) = corrmat;
count = count + 1;
end
all_subs_corrmats(sub,:,:,:) = squeeze(mean(sub_corrmat));
end
mean_corrmat = squeeze(mean(all_subs_corrmats));
atlas_params = atlas_parameters_GrattonLab↙
('Seitzman300','/Volumes/fsmresfiles/PBS/Gratton_Lab/Atlases/');
%plot mean correlation matrix
figure_corrmat_GrattonLab(mean_corrmat,atlas_params,-1,1);
load('/Users/dianaperez/Desktop/Neurohackademy_Tutorial-↙
master/data/Parcel_info/ROI_params.mat')
clear all
load('/Users/dianaperez/Desktop/Neurohackademy_Tutorial-↙
master/data/Parcel_info/ROI_params.mat')
load↙
('/Volumes/fsmresfiles/PBS/Gratton_Lab/Atlases/Seitzman300/old_vers/BigBrain300/BigBrain3↙
00_dmat.mat')
ROI_params.dmat = dmat;
mods_array = ROI_params.mods_array;
load('/Users/dianaperez/Desktop/Neurohackademy_Tutorial-↙
master/data/Parcel_info/Gordon333_net_colors.mat')
net_colors = ROI_params.colors
load('/Users/dianaperez/Desktop/Neurohackademy_Tutorial-↙
master/data/Parcel_info/Gordon333_roi_sort.mat')
roi_sort = ROI_params.sorti;
load('/Users/dianaperez/Desktop/Neurohackademy_Tutorial-↙
master/data/Lifespan_average_correlation_matrix.mat')
%-- 4/27/23, 5:07 PM --%
make_group_avg_corrmat
addpath '/Users/dianaperez/Documents/GitHub/GrattonLab-General-Repo/FCProcess'
make_group_avg_corrmat
clear all
load('/Users/dianaperez/Desktop/Neurohackademy_Tutorial-↙
master/data/iNetworks_average_correlation_matrix.mat')
avg_corrmat = load('/Users/dianaperez/Desktop/Neurohackademy_Tutorial-↙
```

```
master/data/iNetworks_average_correlation_matrix.mat')
clear all
%% Spring-embedding plots
load('/Users/dianaperez/Desktop/Neurohackademy_Tutorial-↙
master/data/iNetworks_average_correlation_matrix.mat')
corrmat = mean_corrmat;
clear mean_corrmat
colors = zeros([size(corrmat,1),3]);
atlas_params = atlas_parameters_GrattonLab↙
('Seitzman300','/Volumes/fsmresfiles/PBS/Gratton_Lab/Atlases/');
for m = 1:length(atlas_params.mods)
colors(atlas_params.mods{m},:) = repmat(atlas_params.colors(m,:),[length(atlas_params.↙
mods{m}),1]);
end
addpath(genpath('/Users/dianaperez/Downloads/DartmouthMIND_tutorial-master/'))
make_spring_fig_MIND(groupmat,0.02,colors,atlas_params.networks,atlas_params.colors);
make_spring_fig_MIND(corrmat,0.02,colors,atlas_params.networks,atlas_params.colors);
thresholds = [0.01:0.01:0.04]; %[0.01:0.01:0.1,0.2,0.3]; %these take a while, esp for↙
higher thresholds. Only do a few.
outdir = '/Users/dianaperez/Dekstop/';
for t = 1:length(thresholds)
%tic;
make_spring_fig_MIND(corrmat,thresholds(t),colors,atlas_params.networks,atlas_params.↙
colors);
saveas(gcf,sprintf('%sSpring_group_t%.02f.tiff',outdir,thresholds(t)),'tiff');
%toc
end
thresholds = [0.01:0.01:0.04]; %[0.01:0.01:0.1,0.2,0.3]; %these take a while, esp for↙
higher thresholds. Only do a few.
outdir = '/Users/dianaperez/Desktop/';
for t = 1:length(thresholds)
%tic;
make_spring_fig_MIND(corrmat,thresholds(t),colors,atlas_params.networks,atlas_params.↙
colors);
saveas(gcf,sprintf('%sSpring_group_t%.02f.tiff',outdir,thresholds(t)),'tiff');
%toc
end
load('/Users/dianaperez/Desktop/Neurohackademy_Tutorial-↙
master/data/Lifespan_average_correlation_matrix.mat')
corrmat = mean_corrmat;
clear mean_corrmat
% Start with a single correlation matrix per subject and network assignment
% [For the group and for the individual separately?]
%submats = squeeze(mean(corrmat,2));
% and colormat variable needed for function:
% information about prespecified networks
colors = zeros([size(corrmat,1),3]);
atlas_params = atlas_parameters_GrattonLab↙
('Seitzman300','/Volumes/fsmresfiles/PBS/Gratton_Lab/Atlases/');
for m = 1:length(atlas_params.mods)
colors(atlas_params.mods{m},:) = repmat(atlas_params.colors(m,:),[length(atlas_params.↙
mods{m}),1]);
end
% Now create across a range of thresholds (1% - 10%, 20%, 30%) for the
% group -- IF TIME
%   1. Discuss consequences of different thresholds
thresholds = [0.01:0.01:0.04]; %[0.01:0.01:0.1,0.2,0.3]; %these take a while, esp for↙
higher thresholds. Only do a few.
outdir = '/Users/dianaperez/Desktop/';
for t = 1:length(thresholds)
```

```
%tic;
make_spring_fig_MIND(corrmat,thresholds(t),colors,atlas_params.networks,atlas_params.↙
colors);
saveas(gcf,sprintf('%sSpring_group_t%.02f.tiff',outdir,thresholds(t)),'tiff');
%toc
end
thresholds = 0.5;%[0.01:0.01:0.04]; %[0.01:0.01:0.1,0.2,0.3]; %these take a while, esp↙
for higher thresholds. Only do a few.
outdir = '/Users/dianaperez/Desktop/';
for t = 1:length(thresholds)
%tic;
make_spring_fig_MIND(corrmat,thresholds(t),colors,atlas_params.networks,atlas_params.↙
colors);
saveas(gcf,sprintf('%sSpring_group_t%.02f.tiff',outdir,thresholds(t)),'tiff');
%toc
end
thresholds = 0.05;%[0.01:0.01:0.04]; %[0.01:0.01:0.1,0.2,0.3]; %these take a while, esp↙
for higher thresholds. Only do a few.
outdir = '/Users/dianaperez/Desktop/';
for t = 1:length(thresholds)
%tic;
make_spring_fig_MIND(corrmat,thresholds(t),colors,atlas_params.networks,atlas_params.↙
colors);
saveas(gcf,sprintf('%sSpring_group_t%.02f.tiff',outdir,thresholds(t)),'tiff');
%toc
end
close all;
load('/Users/dianaperez/Desktop/Neurohackademy_Tutorial-↙
master/data/iNetworks_average_correlation_matrix.mat')
corrmat = mean_corrmat;
clear mean_corrmat
% Start with a single correlation matrix per subject and network assignment
% [For the group and for the individual separately?]
%submats = squeeze(mean(corrmat,2));
% and colormat variable needed for function:
% information about prespecified networks
colors = zeros([size(corrmat,1),3]);
atlas_params = atlas_parameters_GrattonLab↙
('Seitzman300','/Volumes/fsmresfiles/PBS/Gratton_Lab/Atlases/');
for m = 1:length(atlas_params.mods)
colors(atlas_params.mods{m},:) = repmat(atlas_params.colors(m,:),[length(atlas_params.↙
mods{m}),1]);
end
% Now create across a range of thresholds (1% - 10%, 20%, 30%) for the
% group -- IF TIME
%   1. Discuss consequences of different thresholds
thresholds = 0.05;%[0.01:0.01:0.04]; %[0.01:0.01:0.1,0.2,0.3]; %these take a while, esp↙
for higher thresholds. Only do a few.
outdir = '/Users/dianaperez/Desktop/';
for t = 1:length(thresholds)
%tic;
make_spring_fig_MIND(corrmat,thresholds(t),colors,atlas_params.networks,atlas_params.↙
colors);
saveas(gcf,sprintf('%sSpring_group_t%.02f.tiff',outdir,thresholds(t)),'tiff');
%toc
end
close all;
%-- 4/27/23, 6:18 PM --%
load('/Users/dianaperez/Desktop/Neurohackademy_Tutorial-↙
master/data/Lifespan_average_correlation_matrix.mat')
```

```
corrmat = mean_corrmat;
clear mean_corrmat
% Start with a single correlation matrix per subject and network assignment
% [For the group and for the individual separately?]
%submats = squeeze(mean(corrmat,2));
% and colormat variable needed for function:
% information about prespecified networks
colors = zeros([size(corrmat,1),3]);
atlas_params = atlas_parameters_GrattonLab↙
('Seitzman300','/Volumes/fsmresfiles/PBS/Gratton_Lab/Atlases/');
for m = 1:length(atlas_params.mods)
colors(atlas_params.mods{m},:) = repmat(atlas_params.colors(m,:),[length(atlas_params.↙
mods{m}),1]);
end
% Now create across a range of thresholds (1% - 10%, 20%, 30%) for the
% group -- IF TIME
%   1. Discuss consequences of different thresholds
thresholds = 0.05;%[0.01:0.01:0.04]; %[0.01:0.01:0.1,0.2,0.3]; %these take a while, esp↙
for higher thresholds. Only do a few.
outdir = '/Users/dianaperez/Desktop/';
for t = 1:length(thresholds)
%tic;
make_spring_fig_MIND(corrmat,thresholds(t),colors,atlas_params.networks,atlas_params.↙
colors);
saveas(gcf,sprintf('%sSpring_group_t%.02f.tiff',outdir,thresholds(t)),'tiff');
%toc
end
close all;
addpath '/Users/dianaperez/Documents/GitHub/GrattonLab-General-Repo/FCProcess'
addpath(genpath('/Users/dianaperez/Downloads/DartmouthMIND_tutorial-master/'))
load('/Users/dianaperez/Desktop/Neurohackademy_Tutorial-↙
master/data/Lifespan_average_correlation_matrix.mat')
corrmat = mean_corrmat;
clear mean_corrmat
% Start with a single correlation matrix per subject and network assignment
% [For the group and for the individual separately?]
%submats = squeeze(mean(corrmat,2));
% and colormat variable needed for function:
% information about prespecified networks
colors = zeros([size(corrmat,1),3]);
atlas_params = atlas_parameters_GrattonLab↙
('Seitzman300','/Volumes/fsmresfiles/PBS/Gratton_Lab/Atlases/');
for m = 1:length(atlas_params.mods)
colors(atlas_params.mods{m},:) = repmat(atlas_params.colors(m,:),[length(atlas_params.↙
mods{m}),1]);
end
% Now create across a range of thresholds (1% - 10%, 20%, 30%) for the
% group -- IF TIME
%   1. Discuss consequences of different thresholds
thresholds = 0.05;%[0.01:0.01:0.04]; %[0.01:0.01:0.1,0.2,0.3]; %these take a while, esp↙
for higher thresholds. Only do a few.
outdir = '/Users/dianaperez/Desktop/';
for t = 1:length(thresholds)
%tic;
make_spring_fig_MIND(corrmat,thresholds(t),colors,atlas_params.networks,atlas_params.↙
colors);
saveas(gcf,sprintf('%sSpring_group_t%.02f.tiff',outdir,thresholds(t)),'tiff');
%toc
end
close all;
```

```
%-- 4/29/23, 1:34 PM --%
simple = modify_clrfile('simplify','rawassn.txt',minNetSize); %makes a file called↙
rawassn_minsizeX.txt
minNetSize = 20; %400 for vertices, 20 for parcels?
simple = modify_clrfile('simplify','rawassn.txt',minNetSize); %makes a file called↙
rawassn_minsizeX.txt
addpath(genpath('/Users/dianaperez/Documents/Dependencies'))
simple = modify_clrfile('simplify','rawassn.txt',minNetSize); %makes a file called↙
rawassn_minsizeX.txt
regularized = rawoutput2clr(simple);
regularized(regularized < 2) = 0;
regularized = regularized - 1;
dlmwrite(['rawassn_minsize' num2str(minNetSize) '_regularized.txt'],↙
regularized,'delimiter',' ') %makes a file called rawassn_minizeX_regularized.txt
post_infomap_proc
open modify clrfile
open modify_clrfile
type = 'simplify'
clrfile = 'rawassn.txt';
varargin = 20;
modify_clrfile
modify_clrfile('simplify','rawassn.txt',minNetSize);
help nnz
modify_clrfile('simplify','rawassn.txt',minNetSize);
clrs_orig = clrs;
clrs = clrs_orig(:,8:18);
clrs = clrs_orig(:,9:18);
%-- 5/2/23, 9:37 AM --%
timeseries = ft_read_cifti_mod↙
('/Volumes/fsmresfiles/PBS/Gratton_Lab/iNetworks/BIDS/Nifti/derivatives/postFCproc_CIFTI_↙
20.2.0/sub-INET001/ses-1/cifti_timeseries_normalwall/sub-INET001_ses-1_task-rest_run-↙
1_LR_surf_subcort_222_32k_fsLR_smooth2.55.dtseries.nii')
help chol
thresh = 0.05;
bins = [1, 0.9, 0.8, 0.7, 0.6, 0.5, 0.4, 0.3, 0.2, 0.1, thresh];
mod_threshold = 0.05;
fake_signals = {};
i = 1;
count = 0;
bin = bins(i);
real_signal = timeseries;
real_fc = corr(real_signal');
rand_signal = randn(size(real_signal));
real_fc = paircorr_mod(real_signal');
real_fc = paircorr_mod(real_signal);
find(real_signal==NaN)
find(real_signal=NaN)
real_signal = timeseries.data;
real_fc = corr(real_signal');
real_fc = paircorr_mod(real_signal');
load('/Volumes/fsmresfiles/PBS/Gratton_Lab/Lifespan/Post-↙
COVID/BIDS/derivatives/postFCproc_CIFTI/FC_Parcels_333/sub-INET001_rest_ses-↙
1_parcel_timecourse.mat')
real_signal = parcel_time;
real_fc = paircorr_mod(real_signal');
real_fc = paircorr_mod(real_signal);
imagesc(real_fc,[-1 1])
rand_signal = randn(size(real_signal));
try
R = chol(real_fc);
```

```
catch
fc_sim(i) = NaN;
mod_sim(i) = NaN;
continue;
end
try
R = chol(real_fc);
catch
fc_sim(i) = NaN;
mod_sim(i) = NaN;
%continue;
end
[V D] = eig(real_fc);
V_use = V*sqrt(D);
fake_signal = V_use*rand_signal;
fake_signals{j,k} = fake_signal;
fake_fc = corr(fake_signal);
fake_signal = V_use*rand_signal;
fake_signal = V_use*rand_signal';
fake_fc = corr(fake_signal);
fake_fc = corr(fake_signal');
imagesc(fake_fc,[-1 1])
good_corrs = find(fake_fc>.8);
good_corrs = find(fake_fc>.8 && fake_fc<1);
good_corrs = find(1>fake_fc>.8);
good_corrs = find(fake_fc(1>fake_fc>.8));
upper_tri = upper(fake_fc);
upper_tri = triu(fake_fc);
upper_tri = triu(fake_fc, 1);
max = upper_tri
max(upper_tri)
clear max
max(upper_tri)
sig = rand_signal';
plot(sig(78,:))
plot(sig(78,1:100))
smooth_sig = smoothdata(sig(78,1:100));
plot(smooth_sig)
plot(smooth_sig, 'LineWidth', 5)
plot(smooth_sig, 'LineWidth', 3)
hold on
plot(sig(78,1:100))
smooth_sig = smoothdata(smooth_sig);
hold on
plot(smooth_sig)
close all
plot(smooth_sig)
hold on
smooth_sig = smoothdata(smooth_sig);
plot(smooth_sig)
close all
second_sig = fake_sig(79,1:100);
second_sig = fake_signal(79,1:100);
smooth_sig1 = smoothdata(second_sig);
smooth_sig1 = smoothdata(smooth_sig2);
smooth_sig1 = smoothdata(smooth_sig1);
plot(smooth_sig1)
plot(smooth_sig1, 'LineWidth',3)
hold on
plot(smooth_sig, 'LineWidth', 3)
```

```
close all
smooth_signal_1 = smoothdata(fake_signal(78,:));
smooth_signal_2 = smoothdata(fake_signal(79,:));
plot(smooth_signal_1, 'LineWidth', 2)
close all
plot(smooth_signal_1)
hold on
plot(smooth_signal_2)
figure
smooth_signal_1 = smoothdata(smooth_signal_1);
smooth_signal_2 = smoothdata(smooth_signal_2);
plot(smooth_signal_1)
hold on
plot(smooth_signal_2)
smooth_signal_1 = smoothdata(smooth_signal_1);
smooth_signal_2 = smoothdata(smooth_signal_2);
figure
plot(smooth_signal_1)
hold on
plot(smooth_signal_2)
smooth_signal_1 = smoothdata(smooth_signal_1);
smooth_signal_2 = smoothdata(smooth_signal_2);
figure
plot(smooth_signal_1)
hold on
plot(smooth_signal_2)
smooth_signal_1 = smoothdata(smooth_signal_1);
smooth_signal_2 = smoothdata(smooth_signal_2);
figure
plot(smooth_signal_2)
hold on
plot(smooth_signal_1)
sub_smooth_signal_1 = smooth_signal_1(600:1000);
sub_smooth_signal_2 = smooth_signal_2(600:1000);
figure
plot(sub_smooth_signal_1,'LineWidth', 3)
hold on
plot(sub_smooth_signal_2,'LineWidth', 3)
xlabel('BOLD signal')
ylabel('Time')
axis([-1 1 0 400])
axis([0 400 -1 1])
set(gca,'fontsize', 18)
[height, width] = size(gca)
smooth_signal_3 = smoothdata(fake_signal(300,:));
sub_smooth_signal_3 = smooth_signal_3(600:1000);
smooth_signal_3 = smoothdata(smooth_signal_3);
plot(smooth_signal_3)
figure
plot(smooth_signal_3, 'LineWidth', 3, 'Color', 'Green')
plot(smooth_signal_3(1:400), 'LineWidth', 3, 'Color', [0.4660 0.6740 0.1880])
hold on
plot(smooth_signal_2(1:400, 'LineWidth', 3, 'Color', [0.4940 0.1840 0.5560])
plot(smooth_signal_2(1:400, 'LineWidth', 3, 'Color', [0.4940 0.1840 0.5560]))
plot(smooth_signal_1(1:400), 'LineWidth', 3, 'Color', [0.4940 0.1840 0.5560]))
plot(smooth_signal_1(1:400), 'LineWidth', 3, 'Color', [0.4940 0.1840 0.5560])
figure
plot(smooth_signal_2(5:405, 'LineWidth', 3, 'Color', [0.4940 0.1840 0.5560]))
plot(smooth_signal_2(5:405), 'LineWidth', 3, 'Color', [0.4940 0.1840 0.5560])
hold on
```

```
plot(smooth_signal_3(1:400), 'LineWidth', 3, 'Color', [0.4660 0.6740 0.1880])
axis([0 400 -1 1])
xlabel('BOLD signal')
ylabel('Time')
set(gca,'fontsize', 18)
corr(sub_smooth_signal_1, sub_smooth_signal_2)
corrcoef(sub_smooth_signal_1, sub_smooth_signal_2)
corrcoef(smooth_signal_2(5:405), smooth_signal_3(1:400))
corrcoef(smooth_signal_2(6:405), smooth_signal_3(1:400))
figure
plot(sub_smooth_signal_2,'LineWidth', 3, 'Color', [0.8500 0.3250 0.0980])
hold on
plot(smooth_signal_3(1:400), 'LineWidth', 3, 'Color', [0.4660 0.6740 0.1880])
corrcoef(sub_smooth_signal_2,smooth_signal_3(1:400))
corrcoef(sub_smooth_signal_2,smooth_signal_3(1:401))
axis([0 400 -1 1])
%-- 5/8/23, 5:28 PM --%
post_infomap_proc
tmp.data = consen;
ft_write_cifti_mod([str '_conBensus_weighted_minsize' num2str(minNetSize) '_vertices.↙
dtseries.nii'], tmp);
colorChange = [];
inds = unique(consen);
colorChange(:,1) = inds;
colorChange(:,2) = 0:length(inds)-1;
outmat = raw2colors_mat(consen,colorChange);
tmp.data = zeros(size(tmp.data));
tmp.data = outmat;
ft_write_cifti_mod([str '_conBensus_weighted_minsize' num2str(minNetSize)↙
'_consecutive_individual_vertices.dtseries.nii'], tmp);
post_infomap_proc
conBensus
post_infomap_proc
%-- 5/11/23, 2:47 PM --%
load('HCP384_variants_info.mat')
load_nii('/Users/dianaperez/Desktop/thalamus_wta_output_111_mask_MNI.nii')
load_untouch_nii('/Users/dianaperez/Desktop/thalamus_wta_output_111_mask_MNI.nii')
thal_data = ans.img
thal_data = ans.img;
unique_IDs = unique(thal_data);
unique_IDs(1) = [];
relabel = [1, 10, 2, 3, 7, 17, 9, 5, 11, 8, 12];
input = [unique_IDs, relabel'];
raw2colors_mat(thal_data, input);
load_nii('/Users/dianaperez/Desktop/thalamus_wta_output_111_mask_MNI.nii')
nifti_file = ans;
raw2colors_mat(thal_data, input);
addpath '/Users/dianaperez/Documents/GitHub/Lifespan-Analysis'
raw2colors_mat(thal_data, input);
nifti_file.img = ans;
save_untouch_nii(nifti_file, '/Users/dianaperez/Desktop/thalamus_relabeled.nii')
save_nii(nifti_file, '/Users/dianaperez/Desktop/thalamus_relabeled.nii')
input(6,2) = 4;
unique_relabeled = unique(ans);
thal_relabeled = raw2colors_mat(thal_data, input);
unique_relabeled = unique(thal_relabeled);
thal_relabeled = raw2colors_mat(thal_data, input);
size(regularNodes,2)
thal_relabeled(thal_data==25) = 12
thal_relabeled(thal_data==25) = 12;
```

```
unique_relabeled = unique(thal_relabeled)
thal_relabeled(thal_data==21) = 8;
thal_relabeled(thal_data==17) = 11;
thal_relabeled(thal_data==16) = 5;
thal_relabeled(thal_data==15) = 9;
thal_relabeled(thal_data==12) = 4;
thal_relabeled(thal_data==8) = 7;
thal_relabeled(thal_data==7) = 3;
thal_relabeled(thal_data==6) = 2;
thal_relabeled(thal_data==5) = 10;
thal_relabeled(thal_data==4) = 1;
unique_relabeled = unique(thal_relabeled)
save_nii(nifti_file, '/Users/dianaperez/Desktop/thalamus_relabeled.nii')
nifti_file.img = thal_relabeled;
save_nii(nifti_file, '/Users/dianaperez/Desktop/thalamus_relabeled.nii')
load_nii('/Users/dianaperez/Desktop/basalGanglia_wta_output_111_mask_MNI.nii')
load_nii('/Users/dianaperez/Desktop/basalGanglia_wta_output_111_mask_MNI_wbcolors.nii')
bg_nifti = load_nii↙
('/Users/dianaperez/Desktop/basalGanglia_wta_output_111_mask_MNI_wbcolors.nii');
bg_data = bg_nifti.img;
bg_data_relabeled = bg_data;
bg_data_relabeled(bg_data==16) = 4;
nifti_file.img = bg_data_relabeled;
save_nii(nifti_file, '/Users/dianaperez/Desktop/basalGanglia_relabeled.nii')
cb_nifti = load_nii↙
('/Users/dianaperez/Desktop/cerebellum_wta_output_111_mask_MNI_wbcolors.nii')
cb_data = cb_nifti.img;
cb_relabeled = cb_data;
cb_data_relabeled(cb_data==16) = 4;
cb_nifti.img = cb_data_relabeled;
save_nii(cb_nifti, '/Users/dianaperez/Desktop/cerebellum_relabeled.nii')
cb_nifti = load_nii↙
('/Users/dianaperez/Desktop/cerebellum_wta_output_111_mask_MNI_wbcolors.nii');
cb_data = cb_nifti.img;
cb_relabeled = cb_data;
cb_relabeled(cb_data==16) = 4;
cb_nifti.img = cb_relabeled;
save_nii(cb_nifti, '/Users/dianaperez/Desktop/cerebellum_relabeled.nii')
%-- 5/24/23, 10:57 AM --%
timeseries = load('/Volumes/fsmresfiles/PBS/Gratton_Lab/Lifespan/Post-↙
COVID/BIDS/derivatives/postFCproc_CIFTI/FC_Parcels_333/sub-INET001_rest_ses-↙
1_parcel_timecourse.mat');
thresh = 0.05;
bins = [1, 0.9, 0.8, 0.7, 0.6, 0.5, 0.4, 0.3, 0.2, 0.1, thresh];
mod_threshold = 0.05;
fake_signals = {};
count = 0;
real_signal = timeseries.parcel_time;
real_fc = paircorr_mod(real_signal);
rand_signal = randn(size(real_signal));
addpath '/Users/dianaperez/Documents/GitHub/Lifespan-Analysis/utilities'
real_signal = timeseries.parcel_time;
real_fc = paircorr_mod(real_signal);
rand_signal = randn(size(real_signal));
R = chol(real_fc);
help chol
[V D] = eig(real_fc);
V_use = V*sqrt(D);
fake_signal = V_use*rand_signal;
fake_signals{j,k} = fake_signal;
```

```
plot(rand_signal(:,1))
plot(rand_signal(1:400,1))
smooth_signal_1 = smooth(rand_signal(1:400,1));
fake_signal = V_use*rand_signal;
```