

# Comparison between GLM Flex's single interaction column, using Error Term 1 (between-subject's error term) and the analogous one-sample T-test [con-images are the same].

Here the relevant code I used:

```
IN.N_subs = [9 5];
IN.Between = 2;
IN.BetweenLabs = {'g1','g2'};
IN.Within = [2 2];
IN.WithinLabs = {'a1','a2'},{'b1','b2'};
IN.FactorLabs = {'GROUP','A','B'};
IN.Interactions = {[1 2] [1 3] [2 3] [1 2 3]};
IN.EqualVar = [0 1 1];
IN.Independent = [1 0 0];
F = CreateDesign(IN);
figure; imagesc(F.XX); shg, colormap gray, set(gca, 'CLim', [0,1])

%% estimate model
I.OutputDir = '/work/jkeyser/GLMflex_example';
I.F = F;
I.Scans = Scans;
I.RemoveOutliers = 0;
I.minN = 2;
I.DoOnlyAll = 1;
I.CompOpt = 0;
I = GLM_Flex(I);

%% define contrasts
I.Cons(1).name = 'Group Effect';
I.Cons(1).Groups = [1 2];
I.Cons(1).Levs = 2;
I.Cons(1).ET = []; % script chooses 1
I.Cons(1).mean = 0;

I.Cons(2).name = 'Factor A Effect';
I.Cons(2).Groups = [3 4];
I.Cons(2).Levs = 2;
I.Cons(2).ET = []; % script chooses 2
I.Cons(2).mean = 0;

I.Cons(3).name = 'Factor B Effect';
I.Cons(3).Groups = [5 6];
I.Cons(3).Levs = 2;
I.Cons(3).ET = []; % script chooses 3
I.Cons(3).mean = 0;

I.Cons(4).name = 'Interaction GROUP x A';
I.Cons(4).Groups = [7 8 9 10];
I.Cons(4).Levs = [2 2];
I.Cons(4).ET = []; % script chooses 2
I.Cons(4).mean = 0;

I.Cons(5).name = 'Interaction GROUP x B';
I.Cons(5).Groups = [11 12 13 14];
I.Cons(5).Levs = [2 2];
I.Cons(5).ET = []; % script chooses 3
I.Cons(5).mean = 0;

I.Cons(6).name = 'Interaction A x B';
I.Cons(6).Groups = [15 16 17 18];
I.Cons(6).Levs = [2 2];
I.Cons(6).ET = []; % script chooses 4
I.Cons(6).mean = 0;

I.Cons(7).name = 'Interaction level a1,b1';
I.Cons(7).Groups = [15];
I.Cons(7).Levs = 1;
I.Cons(7).ET = []; % script chooses 4
I.Cons(7).mean = 0;

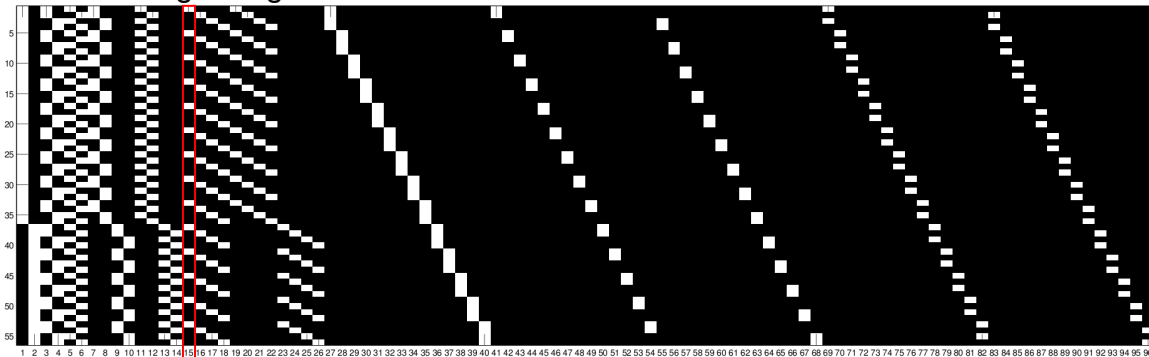
I = GLM_Flex_Contrasts(I);
```

The observation:

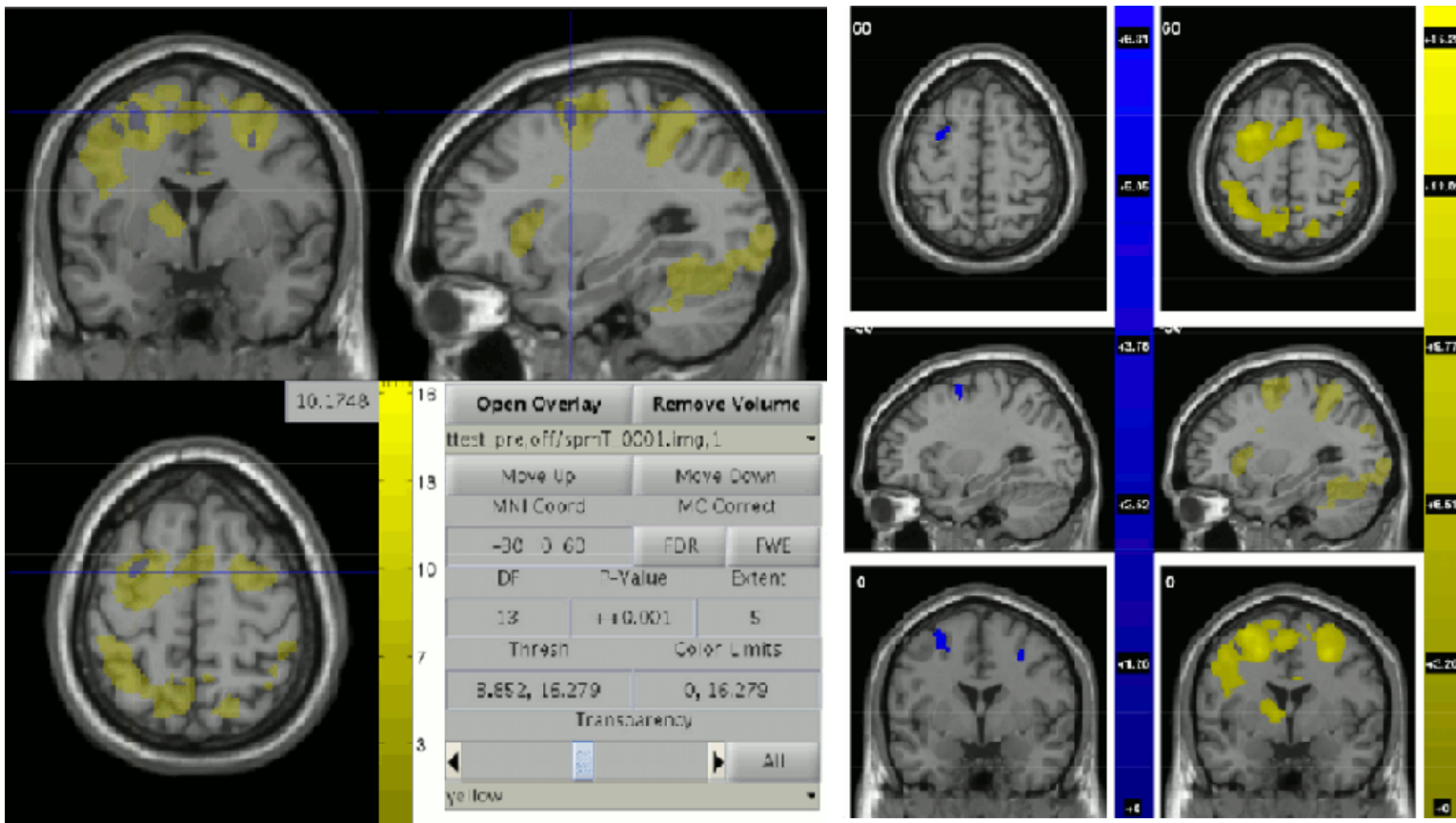
*The O-S t-test is way more liberal than GLM-Flex's contrast.*

*Using either error term (2,3,4), looks much more similar to the T-test.*

The resulting Design:



The Contrast of Interest (analogous to one sample T-test of using the images corresponding to A1,B1)



Using OrthoView for plotting; GLM-flex contrast and one-sample T-test thresholded at p<0.001, uncorrected