May28

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1 What's the next.

1. Refit the soc, with bound [0, 1] and without bound,
2. Do the cross validation for all the dataset.
3. Bootstrap to get the error bar.

2 A breif introduction of the new code.

2.1 Overview of the code

- S1_get_ROImean.m: I think we almost ignore this script. Usually, we directly use the output of this script, which is dataset01, dataset02…..
- S2_get_E: run it to get the "Data/E" folder and all input for the following scripts.
- S3_loop_fit/s3_parrallel_fit: Fit the model get the parameters, R^2, RMSE, and the plots. These two are basically the same, Jon should use the parrallel fit.
- s4_create_tables:
- s5+create_plots:

2.2 Important modules

The new code includes 3 modules.

1. "chooseData.m": Select the dataset, roi, and model

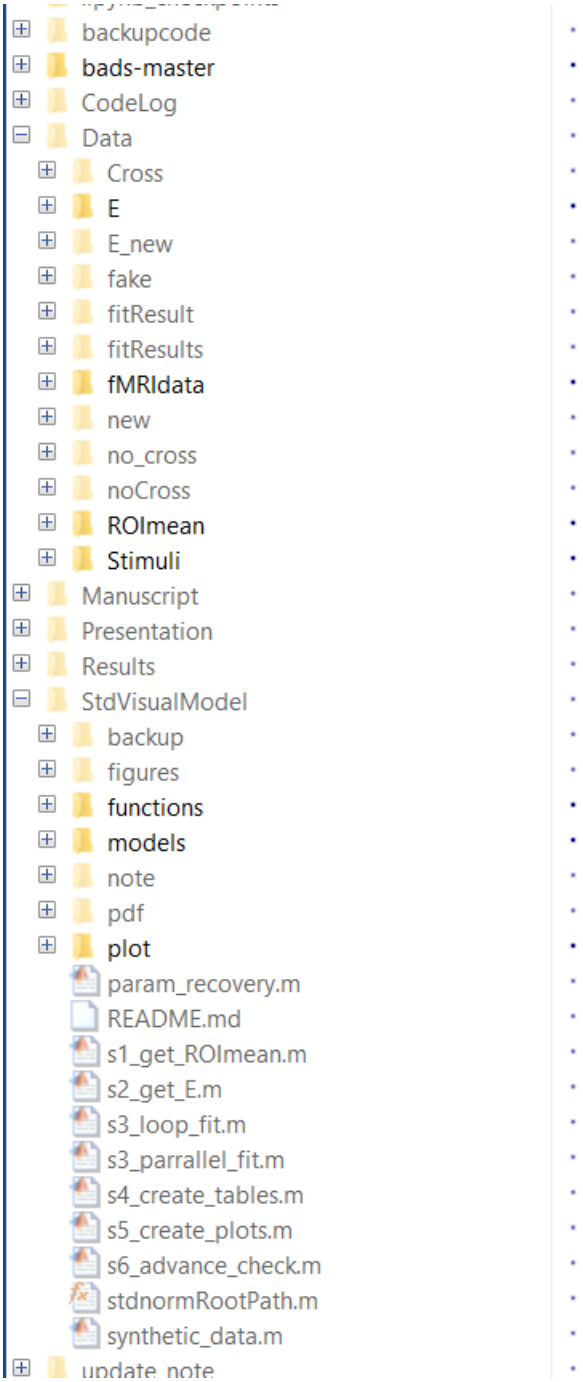
2. "dataloader.m": Help load the data
3. Models: inlcude some modules for each model.

2.3 To use dataloader

To use dataloader, we need to put the data in the appropriate place:

What we can pull from github should be stored at "StdVisualModel" and the data should be stored in "Data".

- The stimuli should be placed at "Data/Stimuli"
- The roi mean should be placed at "Data/fMRIdata"
- run s2_get_E, you will get the folder E with all the input to the model.



2.4 To run the s3_parallel_fit

What we need to change is the hyperparameter section

```
%% hyperparameter: each time, we only need to edit this section !!

optimizer     = 'fmincon'; % what kind of optimizer, bads or fmincon . value space: 'bads', 'fmincon'
target        = 'all';     % Two target stimuli or the whole dataset. value space: 'target', 'All'
fittime       = 40;        % how many initialization. value space: Integer
data_folder   = 'noCross'; % save in which folder. value space: 'noCross', .....
cross_valid   = 'one';     % choose what kind of cross validation, value space: 'one', 'cross_valid'. 'one' is no cross validation.
choose_data = 'soc';       % choose some preset data
```

- optimizer: always “fmincon”
- target: choose from {“all”, “target”}. “all” for all stimuli, “target” for the target stimuli
- fittime:
- data_folder: choose from { ’noCross“,”Cross” }. This is the folder to save data that generated via different method.
- cross_valid: choose from { ‘one’, ‘cross_valid’ }. “one” no cross validation, “cross_valid” knock-1-out
- choose_data: choose from (see the following image): model1: contrast, model3: normVar, model4: soc, model5: oriSurround.

```
switch quick_choice
  case {'all', 'All' }
    models   = { model1, model3, model4, model5};
    model_idx = [ 1, 3, 4, 5];
  case 'orientation'
    models   = {model1,  model3};% , 'normPower'};
    model_idx = [ 1, 3];
  case 'noOri'
    models   = { model1, model3, model4};
    model_idx = [ 1, 3, 4];
  case {'SOC', 'soc'}
    models   = {model4};
    model_idx = [ 4];
  case 'oriSurround'
    models = {model5};
    model_idx = [ 5];
end
```

2.5 To run s4_create_tables and s5_create_plots

Just tune the hyperparameter like what we did in s3_parallel_fit.

2.6 The tasks need to run, estimated run time and hyperparamter section for copy and paste

Cross_validation for all the models. Although I ran the contrast and normVar, I still suggest running all of them.

2.7 cross_validation for All STIMULI

Estimated time All (fittime 40 with fmincon):

1 job = 1 dataset x 1 roi x 1 model

1. constrast:
   - cross: 1 job 40s;
2. normVar:
   - cross: 1 job 40s;
3. soc:
   - noCross: 1 job .5-1 hrs;
   - Cross: 1 job 40 hrs?
4. oriSurround:
   - noCross: 1 job 1-2 hrs;
   - Cross: 1 job 60-100 hrs?

Code for matlab:

```
optimizer          = 'fmincon';
target               = 'all';
fittime              = 40;
data_folder       = 'Cross';
cross_valid        = 'cross_valid';
choose_data     = 'all';
```

2.8 cross_validation for Target STIMULI

Estimated time All (fittime 40 with fmincon):

1 job = 1 dataset x 1 roi x 1 model

1. constrast:
   - cross: 1 job 10s;
2. normVar:
   - cross: 1 job 10s;
3. soc:
   - noCross: 1 job 10 min;
   - Cross: 1 job 8 hrs?
4. oriSurround:
   - noCross: 1 job 20-40 min;
   - Cross: 1 job 30 hrs?

Code for matlab:

```
optimizer          = 'fmincon';
target               = 'target';
fittime              = 40;
data_folder       = 'Cross';
```

```
cross_valid       = 'cross_valid';
choose_data    = 'all';
```

[ ]: