**MK Wittmann, September 2024**

**Basis functions for complex social decisions in dorsomedial frontal cortex**

These folders contain data, analysis scripts and plotting scripts for the above project. I attempted to make it as accessible as possible, which was difficult given the huge amount of data and analyses. I tried my best given time constraints and other obligations. The scripts produce the vast majority of figures from the paper.

We analysed the data using FSL, Matlab (R2023b), Studio (Version 2023.12.1+402 (2023.12.1+402)), and Jasp (0.18.33). We used Matlab’s gramm toolbox for some plots.

Please refer to the manuscript for more information. We labeled files according to the conventions used in the manuscript (e.g. labeled by figure number, study, etc).

**FOLDER STRUCTURE**

brainmaps-folder: nifiti files in standard space for contrasts reported in the paper and masks contains ROIs used in the paper, labelled as <roiname\_MNIcoordinates.nii>

0\_utils: some general functions useful for data analysis and data organisation

1\_data: the data from the experiments

2\_ana: matlab scripts used to analyse the data; output is (mostly) csv files printed into the “3\_out” folder. Sometimes, directly a figure is printed into “5\_figs”

3\_out: Output of analyses, mostly csv files. Note that the statistics for the paper was mostly done on csv files in this folder

4\_plot: Plotting scripts, partly Matlab, partly R, taking the files from the 3\_out folder and plotting them into the “5\_figs” folder. Sometimes plotting is performed on data in the “1\_data” folder directly. Sometimes the plotting scripts also perform some computations

5\_figs: Figures, labelled according to their position in the manuscript

Note that within each folder, scripts/data are often separated by study1/study2/study3/study4. Refer to the paper to see which study is which.

**USAGE**

The analysis pipeline works by going from 1-5 (data to figs). 1\_data and 3\_out folders contain minimally processed and more processed data respectively. The scripts in 02\_ana perform the transformation from 1\_data to 3\_out, and sometimes they print out figures directly into 5\_figs. See the main scripts below, which contain more comments how to use them.

The “4\_plot” folder also contains scripts. These scripts make final figures either from data in 1\_data or from 3\_ana. make the final figures (printed into “5\_figs”) either from raw data or the “3\_out” data.

Note that the scripts use relative paths and the main scripts need to be executed from within their respective folder. I have pre-generated the expected outputs of the “02\_ana” scripts into the “3\_out” folder. And I have also pre-generated all figures that can be produced with the scripts. Figures have a date in the filename to ensure that they are not overwritten. However, the plotting scripts are hard-coded to use the files from the day I created them. If you want to run the “2\_ana” scripts yourself and plot the outputs, you will need to adjust the filenames that are plotted by the “4\_plot” functions.

To more clearly understand details of the analysis procedure, refer to comments in the analyses script. Also, do find the plotting scripts that generate the figure you are interested in and then trace back where the data for the figures is coming from and how it is processed.

**KEY SCRIPTS**

Study 1:

Main behavioural analysis script: 2\_ana/study1/beh\_ANA.m (see here for comments)

Timecourse simulations: 2\_ana/study1/simSelfPosition.m

Main plotting scripts:

* For behaviour: 4\_plot/study1/beh\_PLOT.m (accesses 3\_out)
* For fMRI: 4\_plot/study1/roi\_PLOT.m (accesses 1\_data)
* For timecourse simulations: 4\_plot/study1/roisim\_PLOT (accesses 1\_data)

Study 2:

Analyses behavioural data: 2\_ana/study2/beh\_ANA\_online.m:

Main plotting scripts:

* 4\_plot/study2/beh\_PLOT.R (main results) (accesses 3\_out)
* 4\_plot/study2/beh\_PLOT\_selfbias.m (plots self bias for study 1+2) (accesses 3\_out)
* 4\_plot/study2/beh\_PLOTsubtle.m (plots subtle GLM effects both study 1+2) (accesses 3\_out)

Study 3:

Analyses behavioural data and plots it directly: 2\_ana/study3/beh\_ANA\_motor.m

FMRI scripts:

* For fMRI copes : 4\_plot/study3/COPE\_barplot\_motor.R (accesses 1\_data)
* For timecourse: 4\_plot/study3/Roi\_plot\_motortc.m (accesses 1\_data)

Study 4:

Analyses behavioural data: 2\_ana/study4/beh\_ANA\_online2.m.

Main plotting scripts: 4\_plot/study4/plot\_online2.R (main results) (accesses 3\_out)