"Revealing and reshaping attractor dynamics in large cortical networks"
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Access to code & data

There are 11 stimulation experiments and 5 control experiments as detailed below:

Stimulation

MEA #	Prep date	Age (DIV)
26550	1.11	19
26549	8.11	20
38428	17.11	18
38427	1.11	20
26532	2.3	20
26550	3.5	19
38426	2.11	19
26549	11.11	19
26550	15.11	20
N/A	8.11	21
38428	20.2	21

Control

MEA #	Prep date	Age (DIV)
26550	24.1	21
39740	24.4	18
38427	24.4	21
26536	7.2	20
38427	7.2	21

Each experiment includes the following directories:

- 1 spont (4 hours recording before stimulation)
  - H5 file (raw data)
  - data.mat *\\generated by main_loadsave_spontaneous.m*
- 2 probe
  - H5 file (raw data)
  - data_excluding5msec.mat *\\generated by main_loadsave_probing_20patterns.m*
  - responsiveness_analysis.mat *\\generated by main_analyze_probing_20patterns.m*
- 4 exp (10 hours recording during stimulation)
  - H5 file (raw data)
  - data_excluding5msec.mat *\\generated by main_loadsave_experiment_2nd_protocol.m*
  - analysis_6metrics.mat *\\generated by main_analyze_experiment_2nd_protocol.m*
- 5 spont (4 hours recording after stimulation)
  - H5 file (raw data)
  - data.mat *\\generated by main_loadsave_spontaneous.m*
- spont_events_individuals.mat *\\generated by spont_events_through_time_individuals.mat*
- comparing_events_slidingWin_V2.mat *\\generated by compare_events_evoked_vs_apont_slidingWindow_V2.m*
- ICs.mat *\\generated by freshlook_merged_addition_ICs_V3_includingDuring.m*
- metrics.mat *\\generated by calc_and_save_metrics.m*
- evoked_existence_clusters.mat *\\generated by existence_probe_analysis.mat*
- spontaneous_clusters_separate.mat *\\generated by dynamics_based_clustering_separate.m*

- part2.mat *\\generated by part2_evoked.m*
- similarity_to_probe.mat *\\generated by find_similarity_script_all_no_lag.m*

Figure scripts:

Figure 2 – attractor dynamics: dynamics_based_clustering_separate.m

Figure 3 – evoked responses: cluster5_probe17_trajectories.m & existence_probe_analysis.m

Figure 4 – existence as a function of robustness: existence_probe_analysis.m

Figure 6 – changes in spontaneous activity: main_effect_specificity_spont_stim_vs_not_delta_cdf_V5.m

Figure 7 – evoked become more robust: main_analyze_experiment_2nd_protocol.m & part2_evoked_robustness.m

Figure 8 – mechanism: IC_effect_flattening_V5.m

Activity statistics for all experiments: statistics_across_experiments.m

Packages used:

[1] Jonas (2023). Violin Plots for plotting multiple distributions (distributionPlot.m) (https://www.mathworks.com/matlabcentral/fileexchange/23661-violin-plots-for-plotting-multiple-distributions-distributionplot-m), MATLAB Central File Exchange.

[2] Connor Meehan, Jonathan Ebrahimian, Wayne Moore, and Stephen Meehan (2022). Uniform Manifold Approximation and Projection (UMAP) (https://www.mathworks.com/matlabcentral/fileexchange/71902), MATLAB Central File Exchange.

[3] Rob Campbell (2023). raacampbell/shadedErrorBar (https://github.com/raacampbell/shadedErrorBar), GitHub. Retrieved June 25, 2023.