Functional Interactions Among Neurons within Single Columns of Macaque V1

Overview

This dataset contains neural recordings from V1 in anesthetized macaques viewing oriented gratings as described in the associated paper. Five sessions of data were collected, sessions 1-3 from monkey 1 and sessions 4-5 from monkey 2.

Data format

The data for each session is formatted as a MATLAB structure named **data**. The **data** structure contains the following fields:

- **spiketrain**: array of size `n_trials` x `n_timepoints` x `n_neurons`. Spikes were binned with 1 ms resolution, from 100 ms before stimulus onset to 1000 ms after stimulus onset.
- **Cluster_celltype**: array of size `n_neurons`. The putative waveform class for each neuron. 0 corresponds to axonal-spiking, 1 to fast-spiking, 2 to regular-spiking medium, and 3 to regular-spiking long.
- **Cluster_celldepth**: array of size `n_neurons`. The depth of each neuron in microns. 0 is deeper and closer to the tip of the electrode.
- **Cluster_Included**: array of size `n_neurons`. Indicates whether a neuron is included for further analysis. A value of 1 indicates the neuron is included and 0 indicates the neuron is not included. The inclusion criteria are based on visual responsiveness and minimum firing rate.
- **Cluster_celllayer**: array of size `n_neurons`. The putative cortical layer of each cell. 1 corresponds to layer 6, 2 to layer 4c, 3 to layer 4A/B, 4 to layer 2, and 5 to white-matter.
- **MI_max**: array of size `n_neurons`. The modulation ratio of each neuron (F1/F0). Putative simple and complex cells have modulation ratios larger and smaller than one, respectively.

See https://github.com/et22/functional_connections_macaque_v1 for analysis code, intermediate analysis output files, and instructions for replicating figures.

Data usage and citation

Please inform the author of this dataset (Shude Zhu, zhushude@gmail.com) if you plan to use the dataset for research, and please cite Zhu et al. 2020 (bioRxiv), Trepka, Zhu et al. 2022 (eLife), and the DOI for this dataset if you use the dataset in a publication.