Data processing, analysis, and plotting for the MST-D&D manuscript (anc, chx, stt)

Extraction of raw data

anc_PreProcessing.m

MW_readExperiment.m

MW_importedSortedSpikes.m

anc_TetrodeCheck.m

– Locate every recording session
– Extract task related events
– Extract sorted spikes
– Allign task events and spike events

Extraction of single units

anc_ExtractReceptiveField.m

anc_ExtractMultiTuning.m

– Compute receptive field sensitivity
– Compute tuning to direction and disparity
– Generate mat files for each cell

Plotting

anc_PlotReceptiveField.m

anc_PlotMultiTuning.m

anc_EvaluateRFfit.m

anc_EvaluatingTuning.m

anc_ManualRFfit.m

– Plot coarse receptive field sensitivity at different latencies (reverse correlation)
– Fit 2d Gaussian to receptive field at the latency with highest variance (bestdelay)
– Visually evaluate the fit
– Manually guide the fitting or assign values (visually assessed)
– Plot coarse direction and disparity sensitivity at different latencies (reverse correlation)
– Plot joint and disjointed cell sensitivity to direction and disparity, at the best delay

anc_GenerateDataTable.m

anc_SelectCellsForTable.m

anc_ExtractSpikeTable.m

anc_storeGAMresults.m

00_main_anc.R

– Generate flat table with mixed information for each unit extracted
– Select sessions with available information regarding receptive field for extracting the table with spike count for GAM models
– 195/267 cells are selected
– Generate a .csv file for each unit
– Run models on each cell and save the output into a mat file
– Copy GAM results from csv files to DataTable

Generating manuscript's figures

anc_Figure_2.m

anc_Figure_3.m

chx_Figure_4.m

anc_AnalysisOutput.m

anc_Figure_S1.m

anc_Figure_S2.m

...

anc_AnalysisOutput.txt

– Define the inclusion criteria and call the scripts to run each individual figure
– Figure 2: plots four example units with the four typical tunings
– Figure 3: summarizes the results from the four models tested on each cell
– Figure 4: runs and plots a semi-simulated population of neurons and assess the decoding power of a feature on the other
– Figure S2: illustrates the sensitivity of an example neuron during the mapping protocol, at different latencies
– Figure s3: illustrates the relationship between eccentricity and area of the receptive fields of the units considered

legend

called by the user — calls → called by another script

depends