Fiber Photometry data analysis. Matlab scripts used for the paper Wilhelm, Sych et al. NatComm 2023

In our manuscript, we analyzed fiber photometry recording of GCaMP6m signals and behavior of mice in the maze during T-maze alternation task.

We used Matlab 2020b version. The data needed for the current analysis can be found at Zenodo <https://zenodo.org/records/8387632> This dataset includes the pre-processed data from the fiber-photometry as well as miniscope recordings.

Code used to do behavioral analysis is organized into one folder:

1. **utilities**: functions allowing for calculating

* zscore.m
* shadedErrorBar.m
* barwitherr.m

1. **libraries:** inpaint\_nans and dowload u-map Version 4.4 from https://ch.mathworks.com/matlabcentral/fileexchange/71902-uniform-manifold-approximation-and-projection-umap?s\_tid=mwa\_osa\_a
2. read\_dlc\_coordinates.m and read\_dlc\_coordinates\_opto\_perturb.m , read csv files generated by the DeepLabCut model tracking animal behavior. The program calculates behavioral parameters from selected types of trials (e.g., when trials with Correct Left or Correct Right turn at the T-junction should be compared). The program structures the data (concatenated behavioral parameters are referred to as behavioral model), u-map low dimensional embedding is performed to simplify high-dimensional behavioral data into 2D space, followed by subsequent k-means clustering. Clusters represent trials with similar behavioral parameters that are labeled and analyzed together, for example to show that dF/F calcium signals are not affected by motor behavior.
3. plot\_compare\_by\_mouse.m uses pooled data from read\_dlc\_coordinates.m and compares behaviors separately within each mouse to demonstrate that during the maintenance (delay) period in the T-maze mice have no preference in the orientation or the direction of turns.
4. pool\_behavioral\_clusters\_photometry.m similarly to read\_dlc\_coordinates.m does u-map low dimensional embedding to simplify high-dimensional behavioral data into 2D space. Low dimensional space is plotted across trials and across mice.