CRCNS.org pfc-6 data description
Version 0.7 (March 12, 2018)

Activity of neurons in rat medial prefrontal cortex during learning and sleep

Summary

This dataset contains neuronal ensemble recordings from the medial prefrontal cortex (mostly prelimbic cortex) of freely moving rats, using tetrodes. Data were collected while the animals learned a behavioral contingency task, as well as during sleep before and after the task.

Results from the experiments are described in:

> Replay of rule-learning related neural patterns in the prefrontal cortex during sleep.
> Adrien Peyrache, Mehdi Khamassi, Karim Benchenane, Sidney I Wiener, Francesco P Battaglia. *Nature Neuroscience* 12(7):919-26 (July 2009) doi: 10.1038/nn.2337

Conditions for using the data

If you publish any work using the data, please cite the publication above (Peyrache et al., 2009) and also cite the data set using the following:

Adrien Peyrache, Mehdi Khamassi, Karim Benchenane, Sidney I Wiener, Francesco Battaglia (2018); Activity of neurons in rat medial prefrontal cortex during learning and sleep. CRCNS.org
http://dx.doi.org/10.6080/K0KH0KH5

Methods

All methods are described in the reference above.

Data files organization

Each folder corresponds to one session. The session ID is a 6 digit number:
The first two digits are the animal number; the next four are month and day = [ID, MM, DD]

Data format

Each folder contains 7 files:
- ..._Behavior.dat
1st column: trial start (in ms, as all other time values)
2nd: trial end (animal arrives at the reward site)
3rd: trial rule (1: go right, 2: go the lit arm; 3: go left, 4: go to dark arm)
4th: correct (1) or incorrect (0) trial
5th: the animal went right (0) or left (1) [
6th: light position (switched on randomly at the beginning of each trial, even for left/right tasks). (right:0 or left:1)

..._SpikeData.dat:
1st: time of spike (in ms)
2nd: identity of the cell

..._CellType.dat:
the cell was a putative pyramidal (2), interneuron (1), or unknown (0)
the number of lines in this file is equal to the total number of cells
Cell type was identified based on spike waveform shape, as per Benchenane et al (2010)

..._Wake(and SwsPost / SwsPre).dat
start (1st column) and end (2nd column) of each behavioral stage (in ms).
SWS corresponds to period of Slow Wave Sleep (also sometimes referred to as non-REM sleep) as determined by periods of immobility associated with high delta and spindle power. Details in Peyrache et al., 2009.

..._Pos.dat:
Animal's position in a 3 column table.
1st: time (in ms)
2nd: x position
3rd: y position

Trials during which learning occurred
In a subset of sessions, the animals learned the rule (as described in Peyrache et al., 2009). These sessions are:
'201222';'201227';'201229';'181012';'181020';'150628';'150630';'150707';'190214';'190228';

The rule was acquired at the following trials (in the respective order):
23;23;14;5;10;12;5;18;11;8;

How to get started
The attached script 'Load_And-View_Data_Examples', written by Dr Mark Humphries, shows how to basically load the data in Matlab, separate trials, and run some basic computation (firing rate difference between error and correct trials)

How to get help
To get help with the data set post any questions on the forum at CRCNS.org.

References
Coherent theta oscillations and reorganization of spike timing in the hippocampal-prefrontal network upon learning.
Karim Benchenane, Adrien Peyrache, Mehdi Khamassi, Patrick L Tierney, Yves Gioanni, Francesco P Battaglia, Sidney I Wiener. *Neuron* 66(6):921-36 (24 June 2010) doi: 10.1016/j.neuron.2010.05.013

Change history
Version 0.7 (March 12, 2018) – Initial version.