Notes for ACS Chem revision and Matlab analysis code

Raw data files are acquired using the LabView-based software, TarHeel Bob4, and University of Washington custom hardware for voltammetry experiments. Queries about hardware and software should be addressed to Dr Scott Ng-Evans ([ngevans@uw.edu](mailto:ngevans@uw.edu)).

Each 2-minute data file includes an accompanying .txt file containing the time of events as shown in the table below:

|  |  |
| --- | --- |
| Bit | TTL / Event |
| 0 | Cue (pellet trials) |
| 1 | Pellet (cued trials) |
| 2 | Nose poke |
| 3 | Cue (infusion trials) |
| 4 | Infusion (cued trials) |
| 5 | Pellet (uncued trials) |
| 6 | Infusion (uncued trials) |
| 7 | Dummy solenoid click |

Snips from raw data files centred around events of interest (+ / - 10 seconds) were made using CV\_BatchCutandSplice to split into five trial types as shown below.

|  |  |  |  |
| --- | --- | --- | --- |
| Trial type # | Trial type | Bit # | Save folder |
| 1 | Cued pellet | 0 | 01\_pelletcue |
| 2 | Cued infusion | 3 | 02\_infcue |
| 3 | Probe pellet | 5 | 03\_probepellet |
| 4 | Probe infusion | 6 | 04\_probeinf |
| 5 | Dummy | 7 | 05\_dummy |

Calibration matrices were made for each rat using dopamine transients evoked by cocaine+raclopride at the end of each recording session. Representative dopamine and pH CVs along with a calibration factor obtained before the recording session were passed to a Matlab script (CVMatrix) to generate ‘CVMatrix.txt’ and ConcMatrix.txt’.

The chemometrics batch process method on TarHeel was used to generate dopamine concentration values for all snips (CONC files; background at 5s).

The matlab script, main.m, was used to extract data and assemble into a file with matrices containing data and metadata for further analysis.

Average responses for each rat for each trial type were produced with voltanalysis\_pvi.m (this included a baseline correction step).

Epochs were selected with pvi\_avg\_stats.m and matrices were made for Cued and Uncued trials for statistical analysis in SPSS

Get appropriate behavioural files into new directory structure

List of Matlab scripts required:

Helper scripts

nanmean.m

getcols.m

trials.m

unpacked.m

noiseQa.m

pvicols.m

CVMatrix.m

shadedErrorBar.m

nanroc.m

rocN.m

rocshuf.m

removenanrows.m

main.m

extractdata.m

voltanalysis\_pvi.m

lineplot\_pvi.m

pvi\_reptraces.m

approach\_analysis.m

prob\_approach\_fig.m

approach\_and\_volt\_fig.m

roc\_pvi.m

pvi\_roctraces.m

pvi\_rocvalsfig.m