

CRCNS.org hc-4 data description
Version 0.5 (Dec 18, 2014)

Summary.

The CRCNS.org hc-4 data set contains recordings made from multiple hippocampal areas in Long-Evans rats. The data set contains raw data that is associated with sessions in the hc-3 data set, but not included in that data set. The relationship between the hc-3 and hc-4 data sets are as follows: For each electrode placement, the hc-3 data set typically contains only a subset of the sessions recorded (usually sleep sessions are not included), and the original broadband (raw) data are not included. The corresponding data in the hc-4 data set includes all the sessions, the raw data, and all of the derived data that was used to do the spike sorting. Because more sessions are included and the raw data are very large, the volume of data in a directory in the hc-4 data set is much larger (about 10x) than the corresponding data in the hc-3 data set. For that reason, currently only a subset of directories in the hc-3 data set are included in the hc-4 data set. (In this initial release, only one, given in the example below. But more may be added).

The names of top level directories (i.e. directories storing data from a particular electrode configuration) are different between the two data sets. An example is shown below:

hc-3 data set directory name	hc-4 data set directory name
ec014.39	ec014.716_742

The name of the hc-4 data sets include animal name (ec014) and the range of sessions (716-742). The corresponding directory in the hc-3 data set (e.g. ec014.39) is given by the name of the Excel file in the hc-4 data set directory (e.g. ec014.39.xls, see next section). It can also be determined by using the hc-3 metadata tables as described at the end of this document.

Files in hc-4 data set:

Data recorded from each single electrode placement is stored in separate directory. For example, directory “ec014.716_742”. Within this top-level directory the data is organized as follows:

RawData - a directory containing the raw data for each session. Format of the data is the same as described in the hc-2 data set documentation (binary integers, stored in files with extension “.dat”, and compressed).

ClusteredData.tar.gz - contains all files used for clustering (spike sorting). All but three of these files follow the convention described in the hc-2 and hc-3 documentation. Each file contains data from all of the sessions concatenated together. In addition, three files (with extension: .sts.RUN, .sts.SWS and .sts.REM) are ASCII files which have two columns giving the start (1st column) and end (2nd column) times of the RUN

(exploration), SWS (Slow-Wave Sleep) and REM (Rapid Eye Movement sleep) epochs respectively.

ec014.039.xls – an excel spreadsheet containing information about the sessions that were concatenated for spike sorting (stored in ClusteredData above). The name of the file (without the extension, e.g. ec014.039) is the name of the directory in the hc-3 data set containing sessions recorded from the same electrode placement. The spreadsheet contains the session, behavior, novelty and duration of each session that was concatenated. The duration can be used to split the concatenated files into individual sessions that correspond to the raw data files and the sessions used in the hc-3 data set.

ElectrodePosition.txt – text file specifying brain region for each shank.

Example SQLite queries.

The SQLite data base (provided with the hc-3 metadata tables) can be used to find information about the session data stored in the hc-4 data set. Examples are given below. Information helpful for using these examples (i.e. how to startup SQLite) is given in the hc-3 data description document.

-- To find directory in hc-3 corresponding to directory in hc-4 ('ec014.716):

```
sqlite> select topdir from session_a where session like 'ec014.716';  
ec014.39
```

-- To get information about all sessions including those that are not in and behaviors for sessions in 'ec014.39' select from

-- table 'session_a':

```
sqlite> select session, behavior from session_a where topdir = 'ec014.39';  
ec014.716|sleep  
ec014.717|sleep  
ec014.718|sleep  
ec014.720|sleep  
ec014.723|midSquare  
ec014.726|wheel  
ec014.727|wheel  
ec014.729|midSquare  
ec014.730|sleep  
ec014.731|sleep  
ec014.732|sleep  
ec014.733|sleep  
ec014.734|sleep  
ec014.735|sleep  
ec014.738|sleep  
ec014.739|sleep  
ec014.741|sleep
```

ec014.742|sleep

-- To get list and behavior of sessions included in hc-3 data set, run same query on table

-- session (not 'session_a'):

sqlite> select session, behavior from session where topdir = 'ec014.39';

ec014.723|midSquare

ec014.726|wheel

ec014.727|wheel

ec014.729|midSquare