HC-3 dataset
Buzsaki Lab

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Signals

High density electrode recordings in behaving animals
Device

« probe »

« shank »
4 shanks, 32 electrodes

« electrodes »
Raw Data Format

• Binary files (no header, continuous)
Ephys signals + sync signals + events (TTL)

http://neurosuite.sourceforge.net/formats.html

Channel layout, sampling rate, amplification gain etc. stored in a separate xml file
Processed data

• Spikes
  – Snippets from the data file (32 samples @20kHz, 1.6ms)
  – Spike times
  – Cluster identity
    Kkwik + manual spike sorting

• Local Field Potentials (LFP)
  Data downsampled at 1250 Hz

• Position
  (x,y) position of LEDs, synchronized to the ephys data
Requirements

• Database of anatomical locations

• Cell types (extracellular features, optogenetics)

• Environments (novel? familiar?)

• Brain states
  (Wake, Quiet, Slow Wave Sleep, REM sleep, etc.)
Anatomical locations

7 animals, different recording configurations

4-16 shanks in the hippocampus
CA1 – CA3 – DG

4 shanks in the entorhinal cortex
Layers I – V

1 recording session
Recorded neurons

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<th>total</th>
<th>principal cells</th>
<th>interneurons</th>
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<td>670</td>
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<tr>
<td>DG</td>
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</tbody>
</table>
Environments

- Open fields
- Linear track
- Different degrees of familiarity
What’s important?

• Cellular activity is inferred from extracellular potentials
  e.g. firing rates may be biased by spike detection threshold

• Long recordings (4-8 Hrs)
  Some questions may require to test more carefully for recording stability of spikes and brain state fluctuations

• Noise contamination (e.g. chewing).

Sharing responses to questions about the dataset (forum, FAQs, mailing-list, etc.)
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- Brain states
  (Wake, Quiet, Slow Wave Sleep, REM sleep, etc.)