Svoboda lab data

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Some guiding principles and requirements

- goal of standard **neurophysiology** format:
  i) re-analysis/sharing, across labs (and within labs)
  ii) reproducibility
  iii) meta-analysis across data sets
  iv) improving analysis methods, including raw data

- accessible, machine-readable format
- standardization focusing on **processed data**
- flexible and extensible
- **everything that can be specified needs to be specified** (i.e. low and high-level metadata) (but not more) ...

- handling raw data
  i) easy linking back to original data points
  ii) common time base

- the NWB project: Come up with a data format for ephys and ophys
  i) in one-year
  ii) that deals with the diverse use-cases in the room (our data sets)
  iii) also takes into account other use-cases so that the format is reasonably general (i.e. covers > 90 % of the neurophysiology use-cases)
Behavior

Need to specify / include:

• Behavior-related time series (evenly spaced data, but sometimes with missing values)
• Behavior-related events (time-stamps with data)
• Behavior-related epochs (time periods with defined starts and stops)
• Links to raw data (i.e. behavior video)
• Common/unified time base for all data streams
Extracellular recordings

Need to specify / store:

• Location of each electrode
• Parameters related to electrodes
• Parameters related to spike sorting, including wave forms
• Information related to cell-type identification (optogenetics; antidromic stimulation)
• Links to raw data (i.e. extracellular potentials)
Intracellular recordings

Need to specify:

- Similar to brain slice data – as in Jim Berg’s talk
- Raw data is part of the format
- Recording location
- Link to morphology data
• 1000-2000 neurons imaged @ 7 Hz
• 12,000 neurons in a behavioral session
• 70 % of L1-3 neurons; 25 % L5 neurons

Imaging (optophysiology)

Need to specify / store:

• Parameters related to image image acquisition
• Fluorescence dynamics of each neuron
• Location of each neuron (ROI) (with the image stack and within the brain)
• Links neurons across sessions / time
• Parameters related to image analysis
• Links to raw data (i.e. image stacks)
• Links to image data relevant to cell-type id