

## **CRCNS.org mt-2 data description**

Version 0.10 (May 1, 2018)

Extracellular recordings from area MT of awake macaques in  
response to naturalistic movies

### **Summary**

This document describes CRCNS mt-2 dataset. The dataset contains activity of 45 neurons in the area MT of awake macaques in response to naturalistic movies. The data were originally published in Nishimoto and Gallant 2011 (see below for full reference).

### **Conditions for using the data**

If you publish any work using the data, please cite the references listed below:

Shinji Nishimoto, Jack L. Gallant (2011). A three-dimensional spatiotemporal receptive field model explains responses of area MT neurons to naturalistic movies. *The Journal of Neuroscience*, 31(41):14551-64.

Shinji Nishimoto, Jack L. Gallant (2018). Extracellular recordings from area MT of awake macaques in response to naturalistic movies. CRCNS.org.  
<http://dx.doi.org/10.6080/K0DN4374>

### **Data file organization and format**

The dataset contains 45 MATLAB (HDF5, compatible with Python/NumPy) data files. Each file stores stimuli, neural activity, and related information for an MT neuron.

### **Neural Activity**

Extracellular signals were recorded from the area MT of two macaque monkeys (*Macaca Mulatta*) using epoxy-coated tungsten electrodes (FHC). The signals were sorted to identify single neurons (please see Nishimoto and Gallant 2011 for more

detail). Data from a neuron is stored in a MATLAB file (HDF5 format compatible with NumPy/Python).

Related variables in each file:

cellid: neuron ID (subject ID + neuron number, e.g., 'f0050')

psth: spike counts, averaged and binned at 83 Hz (stimulus frame rate)

## **Task and Stimuli**

The subjects performed a simple fixation task while we presented motion-enhanced natural movie stimuli. The original movie stimuli were shown full screen (36 x 27 degrees of visual field). For each neuron in this dataset, we stored a part of the movie stimuli that covered around 2 times the receptive field of the neuron. The movie frames were down-sampled to 128 x 128 pixels.

Related variables in each file:

rawStims: movie frames around the receptive field

ranges.crange: the frame indices for training stimuli

ranges.vrange: the frame indices for validation (test) stimuli

## **How to get started**

The files provided are in MATLAB format, so use the standard "load" function to load the files.

To load the files in Python, you'll need the pyTables library, as well as NumPy.

Here is an example of using Python to load activity (PSTH) for a neuron:

```
import tables, numpy
```

```
f=tables.openFile('ct0130_arg0466d_128.mat')  
f.listNodes # Show all variables available  
data = f.getNode('psth')[':'] # load activity  
f.close()  
  
print data[0,1001:1010] # print spike counts for 1001th to 1010th movie frames
```

### **How to get help**

To get help with the dataset post any questions on the forum at [CRCNS.org](http://CRCNS.org).

### **Document change history**

2018-05-01; v0.10 the first version