Task Description

Please read through this task description document in full before begenning the task. Note that the included dataset is intended only for use in this task and should not be redistributed.

The task consists of three parts:

1. Designing and populating a DataJoint pipeline based on an existing dataset and data descriptions
2. Extend the DataJoint pipeline from part 1 and implement a computational analysis.
3. Provide visualization of the computational analysis implemented in part 2.

1. Designing the data pipeline

In the task folder, you will find a dataset file `ret1_data.pkl` and an accompanying data description `Data Structure Description.pdf`. Please study the dataset and the data description carefully and **design a DataJoint pipeline to represent the data relationship and the experimental flow**. As you work through your design, please take notes about your design decisions as we will like to discuss them in a followup session. **Please design and define your pipeline in the DataJoint's tutorial database so that we can access your pipeline easily upon the submission**. Please ensure that the design of your pipeline reflect the major entities of the experiment including animals, spike trains, etc.

Please populate your data pipeline with the data from the provided dataset, so that everything in the dataset can be found within your data pipeline.

2. Computing Spatio-Temporal Receptive Fields (STRF)

The dataset contains retinal's neurons' responses to white noise movie stimulus, which is ideal for computing the spatio-temporal receptive fields (STRF) of the neurons. Extend your data pipeline from part 1 to compute the STRF of each recorded neuron using [spike-triggered average (STA) with various delays](). The computed results should be stored as part of your data pipeline.

3. Visualization of STRF

Provide code to visualize the STRP computed in part 2. During the follow up session, we will ask you to present the visualizations of the STRF for one or more randomly selected neurons in the dataset.

Submission instructions

Please complete the above task using Python 3.5+ with [DataJoint for Python](). Please package your code as an (pip) installable Python package. You can submit your solution as a single zip file attached to an email or as a repository on [GitHub]().

Help and External Resources

As you work through the task, you are strongly encouraged to reach out to us either on DataJoint Slack (sign up at [https://datajoint.io]()) or via email with any questions or comments on the exercise. We will be very happy to discuss and clarify questions the dataset, pipeline design, and computational analysis or DataJoint in general.

The documentation and tutorials are available at [https://docs.datajoint.io/]() and [https://tutorials.datajoint.io]().