CS 5540 Project 1

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1 Determining Neuron Sensitivity

1.1 Stimulus Class

The `Stimulus` class is used to give an object definition in Java for each particular stimulus. We define the stimulus as a Java `enum` (a strict or-type enumerative declaration), so there are no fields that we have to extend for each stimulus. The stimuli are used as a defining piece of data our construction of the `Neuron` class.

1.2 Neuron Class

This is a class that we developed in order to accurately represent a neuron. The defining feature of the class is the map that is representative of the spike trains that are recorded for each stimuli. We define the map as *spiketimes*, which is a hashmap which takes a stimulus as a key and outputs a double array detailing all of the spike times for that particular stimulus.

1.2.1 Sensitive Stimuli

This is a simple method to compute (roughly) whether a neuron is sensitive to a a particular stimulus. We first create an outer loop to iterate through the list of all possible stimuli, where we choose a stimulus s. Within that outer loop, we have two inner loops to iterate through the different spike time trials for s. We have an average counter avg which maintains the average spike number from all of the trials that we have gone through for that particular stimulus.

At the termination of the inner loop we have a check to decide if the average number of spikes is high enough for us to determine that it is significant. We have set the "cutoff" point for the number of spikes to be an average of 30 for a given stimulus s. This was a

We also have a method that computes of

1.3 DataParser

In order to use the data provided within the text file, we had to develop a

2 Creating a Response Space

2.1 ResponseSpace

The response space class that we defined performs a lot of the analysis that is needed to run our model.

More text.