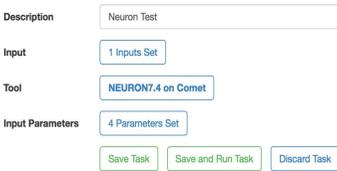
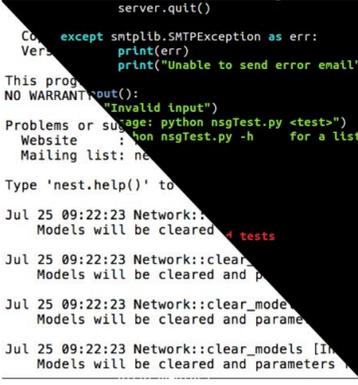
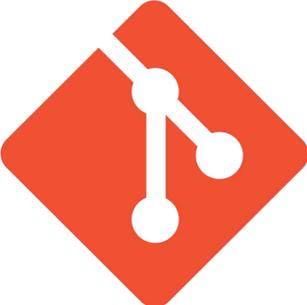


## Abstract:

The goal with this project was to design a script that runs neuroscience tools and validates their outputs. This script is used as a regression test to verify that the software behind the NSG Portal is working correctly.

## Week by Week:

Week 1-2	Week 2-3	Week 3-4	Weeks 4-6	Week 6-7
<p>The first couple weeks were spent mostly with familiarizing with the tools that were going to be used. This included the Unix terminal and the Comet supercomputer.</p> 	<p>Next, the job scripts used for submitting tasks to Comet were revised until they worked. Neuron was the first tool added, but others were added later.</p> <pre data-bbox="457 897 803 1049">#!/bin/sh ##!/opt/python/bin/python #SBATCH -e hello.err # Name of error file #SBATCH -o hello.out # Name of output file #SBATCH --partition=shared #queue is shared, can #SBATCH -J mpitest # Job name #SBATCH -t 00:20:00 # Run time (hh:mm:ss)</pre>	<p>Once Neuron was successfully ran on Comet, the same model was ran on the Portal to ensure it had the same results. After some minor environment changes, the desired result was achieved.</p> 	 <p>The programming of the the test began while simultaneously other tools were researched. Once a job script was finished, it would be added to the test.</p>	<p>This period was very similar to the last, in which more job scripts were made and added to the test. Additionally, errors and improvements were worked on the improve the usefulness. Git was made use of extensively.</p> 

## The Portal:

This is the NSG Portal. It is a web interface that allows scientists to easily submit their neuroscience models to Comet and other supercomputers. Since the goal of the project is to test the portal, a large portion of time was spent understanding how it works, especially concerning Comet submission.



## The Tools:

The Neuroscience Gateway (and by extension, Comet), support a large suite of tools that can be used. However, since time was limited, we could not develop tests for all of these tools. The tools that the test currently supports are as follows: Neuron, Neuron with Python, PGENESIS, NEST, and NEST with Python. Each of these tools is executed in a slightly different way with slightly different data. This is why a separate submission script must be created for each tool. As far as the testing software, it validates that each of these tools are working correctly by hashing the output received, and checking it against a previous output. This is the same for all tests, but the outputs to check for are different.

- [BluePyOpt on Comet \(1.1.27\)](#) - Running BluePyOpt analyses
- [Brian on Stampede \(2.0b2\)](#) - Brian is a simulator for spiking neural networks
- [Brian on Comet \(2.0b2\)](#) - Brian is a simulator for spiking neural networks
- [The Virtual Brain Personalized Multimodal Connectome Pipeline on Comet](#) - Connectome Pipeline on Comet
- [FREESURFER on Comet \(5.3.0\)](#) - Freesurfer tool on Comet
- [PyMOOSE \(3.0.1 Gulab Jamun\)](#) - Running Moose models on Comet
- [NEST on Stampede \(2.6.0\)](#) - Neural Simulation Technology using Python
- [NEST using Python on Comet \(2.2.1\)](#) - Neural Simulation Technology using Python
- [NEST on Stampede \(2.6.0\)](#) - Neural Simulation Technology
- [NEST on Comet \(2.2.1\)](#) - Neural Simulation Technology
- [NEURON7.3 Python on Stampede \(7.3\)](#) - Using Python to run NEURON 7.3
- [NEURON7.3 Python on Comet \(7.3\)](#) - Using Python to run NEURON 7.3
- [NEURON7.3 on Stampede \(7.3\)](#) - Latest NEURON simulation software package on Stampede
- [NEURON7.3 on Comet \(7.3\)](#) - Latest NEURON simulation software package on Comet
- [NEURON7.4 Python on Comet \(7.4\)](#) - Using Python to run NEURON 7.4
- [NEURON7.4 on Comet \(7.4\)](#) - Latest NEURON simulation software package on Comet
- [PGENESIS on Stampede \(2.3\)](#) - Parallel Genesis software
- [PGENESIS on Comet \(2.3\)](#) - Parallel Genesis software
- [PyNN on Stampede \(0.7.5\)](#) - Python package for simulator-independent specification of neuronal network models
- [PyNN on Comet \(0.7.5\)](#) - Python package for simulator-independent specification of neuronal network models
- [Python on Stampede \(2.7.9\)](#) - Running Python models
- [Python on Comet \(2.7.9\)](#) - Running Python models