

Sam Mestern *Graduate Student*



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Profile

Combination molecular and computational neuroscientist (MSc, Ph.D.). I enjoy gaining a deep understanding of data to generate relevant hypotheses. I am experienced with all aspects of the data analysis pipeline, ranging from data cleaning to the utilization of machine learning for research. I am skilled in numerous software packages for data analysis (TensorFlow, spark, Hadoop, PyTorch, sklearn). I have been awarded for open science work. I am also passionate about Scientific outreach and distilling complex topics down for a general audience.

Projects

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|----------------|---|
| 2021 – present | PyCEDFS ↗
A very WIP python module to allow reading and import of Ced File System (CFS) electrophysiology files generated by the signal software suit |
| 2021 – present | sNMO , <i>Single Neuron Model Optimizer</i>
A parameter tuning framework for building neuron models from biological data. |
| 2019 – present | Primate Cell type Database ↗
Contributing backend developer for The JMT Primate Cell Type Database. Built the data dashboard for the intracellular table. |
| 2019 – present | PyApsolation ↗
Python program to automatically extract & analyze action potentials from intracellular electrophysiological time series data. |

Education

Ph.D. Neuroscience, *Western University*
09/2021 – present | London, Canada
Thesis: “*In Silico and In Vitro understanding of local network control of hypothalamic signaling*”

Awards

Ontario Graduate Scholarship,
Ontario Government
2022

Scholars Award for Open Science / Open Code,
CONP
2021

MSc. Neuroscience, *Western University*
05/2019 – 08/2021 | London, Canada
Thesis: “*The role of inflammation in stress signaling & hypothalamic plasticity.*”

BSc. Hons. Neuroscience, *Carleton University*
09/2014 – 01/2019 | Ottawa, Canada
Minor in Psychology. Graduated with High Distinction.
Honours thesis: “*Effects of various early life psychological stressors on plasticity in the rat hippocampus.*”

Deans' Honour List, *Carleton University*
2019

George Fierheller Scholarship,
Carleton University
2016

Professional Experience

2019 – present
London, Ontario

Research Assistant, *Robarts Research Institute*

- Patch-clamp electrophysiologist with a specific focus on pharmacological applications
- Hybrid computational and biological interface
- Immunohistochemistry and other wet lab techniques.
- Basic machine learning techniques (Sklearn, UMAP, TSNE)
- Neural Network based work (Tensorflow, PyTorch)
- Spiking Neural networks and single neuron modelling (C/C++/Python)
- Production implementations of machine learning and visualization into desktop/web apps for non-coders to use

2018 – 2019

Research Assistant, *Royal Ottawa Hospital*

- Working with patient clinical data. Including health records and court proceedings.
- Day-to-day tasks include data entry (SPSS 25), organization and qualitative data coding.

Publications

2022

Recurrent inhibition constrains the activity of corticotropin releasing hormone neurons in the paraventricular nucleus of the hypothalamus, *Elife*

Ichiyama, A., Mestern, S., Benigno, G., Inoue, W., Muller, L., (2021)
(Co-First Author).

Implemented neuron model and facilitated interface of neuron model with biological tissue.

Presentations

2020

A neuron-to-network computational model of state-dependent computation in hypothalamus, *Mestern, S. Benigno, G., Ichiyama, A., Inoue, W., Muller, L., (July 3, 2021). OCNS – CNS*2021. Online.*

2022

Optimal Transport-Based Domain Adaptation for Alignment of Intracellular Electrophysiology Datasets, Mestern, S. Inoue, W. (Feb 26, 2022). NRD 2022. Online. Winner of Spotlight Talk Session A

Organizations

2021 – present
London, Ontario

Outreach Committee - Society of Neuroscience Graduate Students (SONGS), *Editor / Content Creator*

Scripting and starring in small outreach videos for social media. In addition, I perform video content editing using the Adobe suite of tools.

2019 – present
London, Ontario

The Dorsal Column - Society of Neuroscience Graduate Students (SONGS), *Writer*

Wrote articles distilling primary research into readable blog posts aimed at a lay audience.