Mark Agrios

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Research Interests

Computational and theoretical neuroscience. Applications of algebraic topology and differential geometry in studying neural manifolds and neural coding. Neural circuitry. Emergence and criticality in self organizing systems.

Positions

PhD student: Northwestern University
- September 2020 - present

Research Technologist: The Miri Lab, Northwestern University [https://mirilab.org]
- August 2019 - September 2020

Tutor: Calculus, statistics, physics, linear algebra, biophysics
- August 2018 - May 2019

Teaching Assistant: Biostatistics
- August 2018 - May 2019

Academic Training

PhD Neuroscience, Northwestern University, September 2020 - present
B.S. Neuroscience *cum laude*, College of William & Mary, Spring 2019
B.S. Mathematics *cum laude*, College of William & Mary, Spring 2019

Leadership Positions

Pi Mu Epsilon Math honors society at the College of William & Mary
- President: Fall 2018 - Spring 2019
- Vice-President: Fall 2017 - Spring 2018

Grants Awarded

William & Mary honors fellow
- Summer 2018
- Project: *Simplicial Homology and Burst-Synchronizing Neural Networks* (in progress)
  Advisors: Prof Sarah Day (department of mathematics) Prof Drew LaMar (department of biology)

NSF, William & Mary EXTREEMS-QED program

- Summer 2017

Conferences Presented

Undergraduate research project

SIAM, the University of Delaware (talk)	September 2018
Summer research colloquium, William and Mary (talk, invited)	June 2018
SIAM-SEAS, UNC (talk, invited)	March 2018
JMM national conference, San Diego (talk)	January 2018
SUMS, James Madison University (talk)	October 2017
Summer research colloquium, William and Mary (talk)	July 2017

Work with the Miri Lab

Society for Neuroscience, Chicago (poster, co-author)	October 2019

Conferences Attended

BAMM at VCU	May 2017

Computational Experience [https://github.com/markagrios]

Python: Computational topology/homology (GUDHI, PHAT), biological neuron simulation (NEST, Brian2, NEURON), scientific computing (Scipy, Numpy), data analysis and visualization (Pandas, Seaborn)

Matlab: Data analysis/statistics, dimensionality reduction (PCA, ISOMAP, t-SNE, UMAP), parallel computing

Microcontroller software: Arduino, Raspberry Pi

Electrophysiology and spike-sorting software: SpikeGLX, Kilosort/Kilosort2, Phy