John ("Jack") Klawitter

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EDUCATION

Rutgers University, New Brunswick, NJ

Doctor of Philosophy (Ph.D.) in Computer Science (Enrolled)

- Computational Brain Lab, CBIM
- Advisor: Dr. Konstantinos Michmizos

Middlebury College, Middlebury, VT

Bachelor of Arts with Majors in Physics and Computer Science, Magna Cum Laude – February 2023

RESEARCH and WORK EXPERIENCE

Graduate Research Assistant, *Rutgers Computer Science Department* Fall 2023-Present

- Built interpretable ML models for decoding high-dimensional neural time series (EEG and intracortical recordings)
- Applied representation analysis and feature attribution to align model dynamics with biological change
- Spearheaded collaboration between two principal investigators across departments (CS and Psychology)
- Implement neuromorphic ML algorithms on neuromorphic hardware (Intel Loihi)

Research Assistant, *Middlebury Physics Department* Spring and Fall 2022

- Developed Python script to correct the spectra of red quasars
- Published open-source code for use by the astrophysics community
- Code is available: GitHub or installable via PyPI

Machine Learning Intern, *Rolls-Royce* Summer 2022

- Developed deep learning models to detect early warning signs of engine failure in military jet engines
- Performed time-series analysis and anomaly detection, including the use of LSTMs and Autoencoders

Undergraduate Researcher, *Ithaca College Dynamical Systems REU* Summer 2021

- Studied billiard dynamics on surfaces of revolution
- Developed a Mathematica notebook that models billiard dynamics on any surface of revolution within a "billiard board" — any region bounded by a piecewise-defined curve
- Developed original billiard constructions, including a new "unilluminable room" on the sphere and a novel result regarding the existence of periodic orbits on surfaces of revolution.
- Presented findings at the 2022 Joint Mathematics Meeting poster session

Research Assistant, *Middlebury Math Department* Summer 2020

- Worked on Martin Gardner's "Minimum No-3-In-A-Line" Problem
- Examined the use of SAT Solvers as they apply to combinatorial problems
- Modified programs written by Dr. Donald Knuth and created novel Python scripts

PUBLICATIONS

- Klawitter & Michmizos, “Tracking Neural Plasticity Through Incremental Spiking Neural Networks”, Neuro-Inspired Computational Elements, 2026 (Under Review)
- Klawitter & Michmizos, “Critical Spike Attribution for Feature Importance in Spiking Neural Networks”, Neuro-Inspired Computational Elements, 2026 (Under Review)
- Klawitter & Michmizos, “Sequential Learning in Neural Decoders Reveals Interpretable Neural Representations”, Neurocomputing, 2025 (Revision - Under Review)
- Cao, Klawitter, and Manogue, “Periodic Billiard Orbits on Surfaces of Revolution”, Joint Math Meetings, 2022

TEACHING

Course Instructor: Design and Analysis of Computer Algorithms (Summer 2024)

Teaching Assistant: Intro to Discrete Structures I & II (Fall 2024 - Spring 2025), Intro to Artificial Intelligence (Summer 2025)

SKILLS

Python, PyTorch, scikit-learn, Numpy, Pandas, Git, LaTeX