Matthew Murawski

Neuroscience & Computer Science Graduate | Research Assistant
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Profile

Highly motivated recent graduate from the University of Pittsburgh with a B.S. in Neuroscience (minors in Computer Science and Chemistry) and extensive hands-on experience in non-human primate electrophysiology, experimental design, and data analysis. Skilled in designing and fabricating custom experimental apparatuses and in scientific communication.

Education

University of Pittsburgh, Pittsburgh, PA Graduated: April 2025
Bachelor of Science, Frederick Honors College Joint Degree
Major: Neuroscience
Minors: Computer Science, Chemistry
Certificate: Conceptual Foundations of Medicine

Research Experience

Health Sciences Research Fellow, Zhao Lab University of Pittsburgh — September 2025 - Present

- Design and build experimental apparatuses for conducting chronic electrophysiological recordings in frontal cortex of free-moving marmoset monkeys, and simultaneous audio recording
- Analyze the role of frontal cortex in marmoset vocal communication using single-unit and local field potential (LFP) analysis in MATLAB
- Assist in planning of surgical procedures for implantation of chronic electrode microarrays in the marmoset

Research Assistant, Herman Lab University of Pittsburgh — May 2023 – August 2025

- Independently conducted visual attention experiments on non-human primates (NHPs)
- Performed multi-contact electrophysiological recordings during covert visual attention and saccade tasks in superior colliculus (SC), substantia nigra pars compacta (SNc), and lateral geniculate nucleus (LGN)
- Analyzed data from multi-contact electrodes using computational techniques in MATLAB
- Designed and fabricated 3D printed components for experimental setups using AutoCAD and Nexa3D software

Senior Thesis

"Independent Encoding of Salience, Value, and Attention in Primate Superior Colliculus"

- Recorded 220 superior colliculus (SC) neurons in macaques performing a spatially cued covert change detection task and a saccade task that varied reward value and salience.
- Investigated how SC activity is modulated by physical salience, reward, and attention cues.

- Applied single-neuron ROC analyses and population-level support vector machine classification in MATLAB.
- Findings complicate the unified priority map model, potentially suggesting that independent modulatory influences support context-specific visually guided behaviors.

Presentations

- **Poster Presentation, COSYNE 2025**
  Independent Encoding of Salience, Value, and Attention in Primate Superior Colliculus
  View Abstract/Details
- **Talk Presentation, VSS 2025 (Attention: neural mechanisms)**
  Independent Encoding of Salience, Value, and Attention in Primate Superior Colliculus
  View Abstract/Details

Awards

- Neuroscience Research Excellence Award, University of Pittsburgh ($250)
- COSYNE Presenters' Travel Grant ($500)
- VSS Presenters Grant ($1000)
- University of Pittsburgh Merit Scholarship ($60,000)

Teaching Experience

Teaching Assistant, Speaking of Science University of Pittsburgh — Spring 2025

- Assisted in course instruction, helped create class materials, met with students before each presentation, and oversaw class presentations with Drs. Judy Cameron and Susan Sesack.

Teaching Assistant, Intro to Biology 1 University of Pittsburgh — Fall 2022

- Supported course instruction and tutored students with Dr. Lesley Ashmore.

Technical & Research Skills

Research Techniques:

- Multi-contact single-unit electrophysiological recording in Rhesus macaques.
- Chairing and managing visual experiments with non-human primates.
- Single-unit and population-level spike train analysis in MATLAB.
- Designing & fabricating 3D-printed experimental apparatuses (AutoCAD, Nexa3D).

Programming & Data Analysis:

- Proficiency in Java, Python, MATLAB, R, SQL, and Unix/Linux server management.
- Statistical modeling and data visualization (MATLAB, R, Minitab, Excel, Python libraries e.g., Matplotlib).

Software & Communication:

- Extensive experience with Adobe Illustrator and Photoshop.
- Strong scientific writing, communication, and presentation skills.