

Catherine Rasgaitis

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Machine Learning and Computational Neuroscience, University of Washington, Seattle

Education

University of Washington, Seattle, WA BS, Computer Science Minor in Neural Engineering and Computation	2022-2025 3.7
Highline College, Des Moines, WA AS, Computer Science	2020-2022 3.9

Research

Svoboda Lab, Allen Institute for Neural Dynamics, Seattle, WA Undergraduate Research Assistant advised by Camilo Laiton <ul style="list-style-type: none">Perform automated error detection in lightsheet microscopy volumes using computer vision methods.	2024-2025
Noble Lab, University of Washington, Seattle, WA Undergraduate Research Assistant advised by Dr. Anupama Jha <ul style="list-style-type: none">Build a state-of-the-art model to predict Hi-C contact maps for inter (trans) and intrachromosomal (cis) loci from DNA sequence.Use xAI methods to interpret black box models to better understand predictions.	2023-2025
Orsborn Lab, University of Washington, Seattle, WA Undergraduate Research Assistant advised by Dr. Lydia Smith and Katherine Perks <ul style="list-style-type: none">Code and debug a tablet-based “cursor tracking task/game” for rhesus macaque monkeys.Train and supervise both naive and experienced subjects learning the task.Use deep learning methods to predict future task performance and automate task complexity adaptation.Analyze behavioral and neural data, focused on motor learning and feedback and feedforward control.Maintain and redesign in-cage infrastructure, including the reward system.	2022-2025
Regional Cabled Array, Ocean Observatories Initiative, Newport, OR Summer VISIONS 2024 Scholar advised by Dr. Deborah Kelley <ul style="list-style-type: none">Work and live aboard the R/V Atlantis, 300 miles off the coast of Oregon.Assist with underwater photography, logging biology, push core sampling, and constructing water flow instruments. Also use basic wet lab techniques including titration, pipetting, and sterilization methods.	2024-2024
Hou Lab, Cold Spring Harbor Laboratory, Cold Spring Harbor, NY Summer Undergraduate Research Program Participant advised by Dr. Kyle Daruwalla <ul style="list-style-type: none">Build Cheephys3D, a novel tool to generate three-dimensional models of facial muscles alongside subcortical neural recordings in mice. Created a command line tool for synchronizing signals.Perform manual spike sorting and develop a quality control pipeline to verify good clusters.Design a pair of autoregressive models to predict (1) future neural states and (2) future facial muscular states. Compare the models’ hidden state matrices using statistical shape analysis.Design a decoder model to directly predict geometric facial features from neural time series data.	2024-2024

Makeability Lab, University of Washington, Seattle, WA

2024-2024

Undergraduate Research Assistant advised by Jaewook Lee

- Build EARLL, an embodied AR-based language-learning application to interface with the HoloLens2.
- Design depth estimation heuristics for accurate and seamless grab detection.
- Experiment with real-time image segmentation and object detection models, including Grounded SAM.

NASA Jet Propulsion Laboratory, Pasadena, CA

2023-2023

Summer Artificial Intelligence Intern advised by Dr. Mark Johnston

- Construct an extensive data preprocessing pipeline from a human expert's scheduling changelog.
- Leverage behavioral cloning and reinforcement learning methods to automate the scheduling of mission communications on the Deep Space Network (DSN).
- Build a web scraper to extract data from mission wiki pages and DSN documents, to interface with Meta's LLaMA model. Conducted various experiments to query the model about mission requirements.

Behavioral Ecophysics Lab, University of Washington, Seattle, WA

2023-2023

Undergraduate Research Assistant advised by Amanda Hewes

- Analyze high-speed camera trap and GoPro footage of honeyeaters feeding at flowers.
- Artificially augment image datasets with randomized transformations and external data sources.
- Determine presence of honeyeaters, species identification, and number of flowers probed per birds' visit.

Awards and Honors

Weill NeuroHUB and CoNECT Student Travel Award, SfN Neuroscience 2024, Jul 2024, Chicago, IL.

Simons Foundation - Shenoy Undergraduate Research Fellowship in Neuroscience (SURFiN), Jul 2024.

UW Genomics - Herschel and Caryl Roman Undergraduate Scholarship, Jul 2024.

WA NASA Space Grant Scholarship, Apr 2022, Apr 2023, Apr 2024.

UW Undergraduate Research Conference Travel Award, SANS 2024, Apr 2024, Toronto, ON, CAN.

Cold Spring Harbor Laboratory - Dorcas Cummings Scholar Fellowship, Feb 2024.

Pacific Cascade Chapter of the SfN Travel Grant, SANS 2024, Jan 2024, Toronto, ON CAN.

Runner Up for Best Poster, Allen Undergraduate & Master's Research Showcase, May 2023, Seattle, WA.

UW CSE - Denice Dee Denton Scholarship in Computer Science & Engineering, Sep 2022, Seattle, WA.

Major League Hacking Top 50 Hacker, Jul 2022. (Also won 30+ hackathon awards from 2020-2025.)

SHS - John & Mary Vukovich Scholarship, Jun 2022.

Mi Centro - David Almonte Memorial Scholarship, May 2022.

Medium.com - Top Writer for Space, Jul 2021; Top Writer for Innovation, May 2021.

Publications

[Embodied AR Language Learning Through Everyday Object Interactions: A Demonstration of EARLL. Jaewook Lee, Sieun Kim, Minji Park, Catherine Rasgaitis, Jon E. Froehlich. *UIST 2024*.](#)

Talks

Cross-modal analysis of spontaneous facial movements and neural activity in mice

2024

- *Talk for Undergraduate Research Program (URP) Symposium at Cold Spring Harbor Laboratory*

Posters

* = equal contribution

Developing an automatic in-cage touch screen system to optimize high throughput experiments in non-human primates. **Catherine Rasgaitis***, Lydia Smith*, Katherine Perks, Leo Scholl, Amy Orsborn. [SfN Neuroscience 2024](#), Oct 2024.

Opticars: Innovating Mobility with Eye-Controlled Vehicles. **Catherine Rasgaitis**, Daniel Zheng, Lincoln Mansbach, Ruslana Korolov, Evan Wu, Graham Cobden, Joanna Zhou, Peyton Rapo, Eric Chudler. [Allen School Undergraduate and Master's Research Showcase](#), May 2024.

Improving TwinC model for predicting Hi-C contacts from DNA sequence. **Catherine Rasgaitis**, Anupama Jha, William Stafford Noble. [UW Undergraduate Research Symposium](#), May 2024.

Investigating the neural and ocular markers of facial perception. **Catherine Rasgaitis**, Eric Chudler. [Social & Affective Neuroscience Society 2024 Conference](#), Apr 2024.

Decoding Visual Stimuli from Neuropixels Data: A Graph Based Approach. **Catherine Rasgaitis***, David Pak*. [CSE 493 Deep Learning Symposium](#), Mar 2024.

Streamlining Task Complexity Adaptation in Non-Human Primate Training. **Catherine Rasgaitis**, Lydia Smith, Katherine Perks, Penelope Lilley, Leo Scholl, Amy Orsborn. [Women in NeuroAI Symposium](#), Feb 2024; [WaNPRC Scientific Symposium](#), Mar 2024.

Using Machine Learning to Forecast Non-Human Primate Motor Performance. **Catherine Rasgaitis**, Lydia Smith, Katherine Perks, Leo Scholl, Amy Orsborn. [Allen School Undergraduate and Master's Research Showcase](#), May 2023.

Employment History

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|---|-----------|
| Allen School Peer Adviser, University of Washington, Seattle, WA | 2024-2025 |
| <ul style="list-style-type: none">Mentor computer science and computer engineering undergraduates from the Allen School | |
| Michael P. Anderson Aerospace Program Mentor, The Museum of Flight, Seattle, WA | 2024-2024 |
| <ul style="list-style-type: none">Mentor middle school students interested in pursuing STEM, assist in field trips, lead workshops | |
| Web Designer, Highline College Journalism Dept., Des Moines, WA | 2021-2022 |
| <ul style="list-style-type: none">Build and maintain a web edition of the Thunderword, the school newspaperOccasionally write articles for the tech column | |

Skills

Tools

- Languages: Python, SQL, HTML/CSS/JavaScript, TypeScript, Java, C, C++
- Misc: LaTeX, Github, Figma

Relevant Coursework

* = graduate course

- CSE 311, 312: Foundations of Computing I, II; CSE 331: Software Design and Implementation; CSE 332: Data Structures and Parallelism; CSE 333: Systems Programming; CSE 351: Hardware/Software Interface; CSE 442: Data Visualization; CSE 446: Machine Learning; CSE 478: Autonomous Robotics;

CSE 480: Computer Ethics; CSE 486: Synthetic Biology; CSE 490: Neural Engineering; CSE 493: Deep Learning; CSE 599: Machine Learning for Neuroscience*; BIOEN 484: Computational Modeling & Simulation of Bioelectricity; BIOL 130: Introduction to Neuroscience; BIOL 180, 200, 220: Introductory Biology I, II, III; CHEM 220: Organic Chemistry

Organizations and Outreach

President, Synaptech 2023-2025
President of the neurotechnology club at the University of Washington.

→ Projects:

- ◆ Truthinator 3000 (Project Lead) 2024-2025
Biometric lie detector that uses an electric current to “shock” people that act deceptive.
- ◆ Opticars (Project Lead) 2023-2025
Eye-controlled, custom-built Arduino cars.
- ◆ Looking Glass (Project Lead) 2023-2024
Research project to analyze the neural and ocular responses during facial perception in humans.
- ◆ Smart Music (Contributor) 2022-2024
Generate original music compositions in a user’s preferred musical style from neural feedback.

→ Weekly lectures, tutorials, and experiments

I teach a range of lectures (between 1-2 hours) every week. An example of one of my lecture series is *BioBinary*, a tutorial on collecting & preprocessing EEG data, training statistical models for binary classification tasks, and finally deploying models to a web application. I have also run short scientific experiments during my lectures, such as a dual task interference project and a handedness experiment. Shorter lectures have included topics such as neuron tracing, data analysis for Neuropixel probes, neuroanatomy, etc.

→ Events:

- ◆ Neurotechnology Hackathon Organizer, Mentor (2024, 2025)
 - Assist with judging, logistics, and technical support for hackers
 - Workshops I hosted: Biotech Lightning Tutorials; Data Analysis for Neuropixel Probes
- ◆ UW x Rice Neurotechnology Career Panel Host
- ◆ Engineering Fair Volunteer (2023, 2024)
- ◆ Brain Awareness Week Volunteer (2024)
- ◆ Dawg Daze (2023, 2024)
 - Painting with Brainwaves; Brain Games

Vice President, SPACE 2024-2025
Vice President for the engineering-focused SPACE (Students Pursuing Academic & Celestial Excellence) club at the University of Washington.

Crew, LUX Film Production Club 2022-2025
Volunteer crew member and production lead for student films at the University of Washington.
Films: *Green Trace* (assistant camera, 2023); *From the Depths of Space* (gaffer, 2023); *Paranoia* (director and screenwriter, 2023); *Use Case* (camera operator)