Catherine Rasgaitis

Machine Learning Engineering & Computer Science

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EDUCATION

University of Washington - Seattle   *Expected Graduation: June 2025*
Bachelor of Science, Computer Science; Minor in Neural Engineering   *GPA: 3.6*

EXPERIENCE

Research Fellow   Sep 2024 – Present
Svoboda Lab @ Allen Institute for Neural Dynamics   *Seattle, WA*
- Improve compression of lightsheet microscopy volumes using computer vision methods.

Research Assistant   Oct 2023 – Present
Noble Lab @ University of Washington   *Seattle, WA*
- Develop the state-of-the-art TwinC model for predicting Hi-C contact maps for intra and interchromosomal loci.
- Interpret traditionally blackbox models using xAI methods to better understand predictions.

Research Assistant   Oct 2022 – Present
Orsborn Lab @ University of Washington   *Seattle, WA*
- Code and debug a tablet-based "target tracking task/game" for rhesus macaque subjects (monkeys).
- Supervise and train naive subjects to interact with tablet and learn task.
- Design and optimize machine-learning models to predict subjects' future task performance from previous performance, task difficulty, enthusiasm, etc. Develop an algorithm for automatic changes to task difficulty.

Oceanographer   Aug 2024 - Dec 2024
Regional Cabled Array @ Ocean Observatories Initiative   *300 mi offshore of Newport, OR*
- Work and live aboard the R/V Atlantis during the VISIONS 2024 research expedition.
- Assist with underwater photography, logging biology, core sampling, and constructing water flow instruments.
- Use variational autoencoders to analyze and reconstruct whale calls from hydrophone recordings.

Research Intern   Jun 2024 – Aug 2024
Hou Lab @ Cold Spring Harbor Laboratory   *Cold Spring Harbor, NY*
- Build Cheephys3D, a novel tool to generate three-dimensional models of facial muscles alongside subcortical neural recordings in mice. Also created a command line tool for synchronizing signals.
- Design a pair of autoregressive models to predict time series of (1) future neural states and (2) future facial muscular states of mice. 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.

Research Assistant   Jan 2024 – Jun 2024
Makeability Lab @ University of Washington   *Seattle, WA*
- Build EARLL, an embodied AR-based language-learning application to interface with the HoloLens2.
- Design depth estimation heuristics grab detection; run experiments for real-time image segmentation.

AI Intern   Jun 2023 – Aug 2023
Deep Space Network (DSN) @ NASA Jet Propulsion Laboratory   *Pasadena, CA*
- Leverage behavioral cloning and inverse reinforcement learning methods to automate the scheduling of mission communications on the DSN. Build gym to run tests and evaluate various RL architectures.
- Build a web scraper to extract data from mission wiki pages to interface with Meta's LLaMA model. Conducted various experiments to query the LLM about mission requirements and ultimately augment inputs to RL model.

PROJECTS

70+ Hackathon Projects (2022 MLH Top 50 Hacker)
An app to predict natural disasters, an organizational app for food banks, a practice productivity app for musicians, a program that finds optimal species/locations to plant trees, a skin cancer classifier app, etc.

Personal Projects
Music generation from neural data, eye-controlled Arduino cars, biometric lie detector that shocks "liars"

Languages: Python, MATLAB, SQL, HTML/CSS/JavaScript, TypeScript, Java, C, C++
Additional: NumPy, SciPy, pandas, scikit-learn, TensorFlow, Keras, PyTorch, Optuna, wandb, RLlib, nltk, matplotlib, seaborn, plotly, Flask