Mia Onodera

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EDUCATION

University of Illinois Urbana–Champaign August 2025 – June 2030 (expected)
Ph.D. in Electrical and Computer Engineering, *Haptics and Human-Computer Interaction*

University of Washington September 2021 – June 2025
B.S. in Electrical and Computer Engineering, *Machine Learning and Signal Processing*

EXPERIENCE

Interactive Display Lab, University of Illinois Urbana–Champaign August 2025 – Present
Graduate Research Assistant | ***Advisor: Prof. Craig Shultz***

- Prototyping a ring-based haptic interface using electrostatic adhesion for tunable friction, enabling transitions between free, resistive, and locked modes for expressive real-time feedback.
- Iterating CAD designs at millimeter precision to achieve a sleek, compact form factor.

Ingraham Lab, University of Washington January 2023 – June 2025
Undergraduate Research Assistant | ***Advisor: Prof. Kim Ingraham***

- Processed mobility sensor streams to extract joystick usage patterns, characterizing how children interact with mobility devices in real-world contexts.
- Implemented CNN models in a full-stack application to predict proficiency, returning visualizations and predictions within 20 s at 86% accuracy for real-time clinical use.

Hou Lab, Clarkson University May 2024 – September 2024
NSF Funded Research Assistant | ***Advisor: Prof. Daqing Hou***

- Built and trained an RNN/LSTM model for keystroke authentication with TensorFlow, modifying architectures to better capture sequential patterns.
- Designed an evaluation framework analyzing LSTM embeddings to identify key features and improve model interpretability.

Nance Lab, University of Washington February 2020 – January 2024
Undergraduate Research Assistant | *Advisor: Prof. Elizabeth Nance*

- Developed AI-driven image analysis workflows to study cell morphology across large-scale datasets.
- Built a Python preprocessing package that automated 80% of data handling and accelerated data analysis.

Human Powered Submarine, University of Washington June 2021 – August 2023
Safety Lead | *Student Competition Team*

- Designed and prototyped an ergonomic dead man's switch that enabled prolonged comfortable grip, while ensuring immediate release under emergency conditions.
- Integrated and tested the fail-safe pneumatic safety system with pilots to validate reliability, contributing to the team's 2nd place overall at the International Submarine Races.

Lawrence Berkeley National Laboratory, Department of Energy June 2023 – August 2023
DOE Funded Intern | *Facilities Department*

- Automated the mapping of MicroSTAR sensors to building layouts using Python, reducing engineers' manual mapping workload by 92%.

PROJECTS

Haptic Finger-Press Glove March 2025 – June 2025
University of Washington | Graduate Project for Human-Computer Interaction

- Designed and fabricated a glove with Velostat-based pressure sensors embedded in the fingertips to detect presses through signal normalization and thresholding.
- Implemented Arduino firmware in C++ to process fingertip pressure and developed a Python interface for real-time visualization.

T-Mobile Adaptive Drone Flight Using Real-Time 5G RF Data January 2025 – June 2025
University of Washington | Industry-Sponsored Capstone

- Led a seven-person team to develop adaptive path-finding algorithms to optimize drone flight paths under dynamic 5G RF conditions, contributing to the team's 2nd place overall in the ECE Capstone Showcase.
- Simulated performance in MATLAB and validated through real-world drone flights, achieving up to +7 dB RSRP and 190% throughput improvement at higher altitudes.

Human Detection March 2024 – June 2024
University of Washington | Graduate Project for Machine Learning & Signal Processing

- Trained YOLO-based object detection models on multi-camera video datasets to identify humans.
- Applied preprocessing and fine-tuning to improve detection robustness, achieving around 92% accuracy.

PRESENTATIONS

Onodera, M. (May 2025). ***Design and Deployment of a Sensor-Based System for Assessing Powered Mobility Usage in Younger Children in Clinical Settings.*** Advised by Dr. Kim Ingraham. Poster presented at the *Undergraduate Research Symposium*, University of Washington, Seattle, WA.

Onodera, M. (May 2025). ***Design and Deployment of a Sensor-Based System for Assessing Powered Mobility Usage in Younger Children in Clinical Settings.*** Advised by Dr. Kim Ingraham. Poster presented at the *Center for Research and Education on Accessible Technology and Experiences*, University of Washington, Seattle, WA.

Onodera, M., Devlen, C., & Hou, D. (Nov 2024). ***Characterizing Decision Characteristics from TypeNet Models Using the Clarkson II Keystroke Dataset.*** Oral presentation at the *Gulf Coast Undergraduate Research Symposium (GCURS)*, Rice University, Houston, TX.

Onodera, M., Devlen, C., & Hou, D. (Jul 2024). ***Characterizing Decision Characteristics from TypeNet Models Using the Clarkson II Keystroke Dataset.*** Poster presented at the *Research and Project Showcase*, Clarkson University, Potsdam, NY.

Onodera, M. (Nov 2023). ***Cross-Species Quantitative Microglia Branching Analysis.*** Advised by Dr. Elizabeth Nance and H. Helmbrecht. Oral presentation at *GCURS*, Rice University, Houston, TX.

Onodera, M. (May 2023). ***Cross-Species Quantitative Microglia Branching Analysis.*** Advised by Dr. Elizabeth Nance and H. Helmbrecht. Oral presentation at the *Undergraduate Research Symposium*, University of Washington, Seattle, WA.

TEACHING EXPERIENCE

EE 342 Signals, Systems, and Data II, University of Washington October 2024 – June 2025
Grader

CSE 12X Intro Java Series, University of Washington January 2023 – October 2024
Grading Lead / Teaching Assistant

HONORS & AWARDS

2024	Best Poster in Math, Computer Science, and Cybersecurity, Clarkson University
2024	Gulf Coast Undergraduate Research Symposium (GCURS) Travel Award, Rice University
2024	Lee Prock Endowed Scholarship, UW Electrical and Computer Engineering
2024	Arthur Burman Winter Endowed Scholarship, UW Electrical and Computer Engineering
2023	Gulf Coast Undergraduate Research Symposium (GCURS) Travel Award, Rice University
2023	Mary Gates Research Scholarship, University of Washington
2021–2022	Olga and James McEwing Endowed Scholarship, UW College of Engineering
2021	Blue Ribbon Scholarship, Washington State Fair Foundation
2021–2025	Husky Promise, UW Financial Aid

SKILLS

Fields of Impact: Haptics, Human-Computer Interaction, Machine Learning, Signal Processing
Programming: Python (PyTorch, scikit-learn), Java, C/C++, HTML, Bash, MATLAB, Git/GitHub
Machine Learning: CNNs, RNN/LSTMs, Transformers, YOLO Object Detection, Random Forests
Hardware: Arduino, Teensy, Oscilloscope, PCB Design, Embedded Systems
Fabrication: Soldering, 3D Printing, Laser Cutting, Basic Machine Shop Tools
Techniques: Signal Processing, Computer Vision, Feature Engineering, Model Evaluation

OUTREACH

IEEE Women in Engineering, UW Seattle Branch October 2024 – June 2025
Founding Board Member, Corporate Relations

- Served as liaison between WIE and industry reps (Microsoft, Stryker, Prove), fostering partnership opportunities. Planned and promoted events connecting members with industry mentors.

Bridge Disability Ministries January 2018 – January 2024
Spiritual Connections Volunteer

- Coordinated volunteers to serve 60–100 participants with diverse abilities at community events.

Promoting Equity in Engineering Relationships (PEERs) January 2022 – June 2022
PEERs Leader

- Facilitated discussions on race, identity, and systemic barriers in engineering; helped develop frameworks for reporting and addressing equity and inclusion concerns.

AFFILIATIONS

Institute of Electrical and Electronics Engineers (IEEE) — Student Member, 2024–Present
Eta Kappa Nu (HKN), Beta Pi Chapter — Member, 2025–Present
Society of Women Engineers (SWE) — Member, 2024–Present

RELEVANT COURSEWORK

Graduate	Digital Signal Processing II (ECE 551), Computer Vision (ECE 549)
Undergraduate	Machine Learning for Signal Processing (ECE 443), Control Systems (ECE 447), Digital Signals and Filtering (ECE 474), Human-Computer Interaction (ECE 546)