Ethan Davis

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Research Interests

Scalable probabilistic ML; uncertainty quantification & calibration; out of distribution (OOD) robustness; ML systems (MLSys) & high performance computing.

Education

M.S., Computer Science 2024–2026
University of Washington Bothell — Bothell, WA

Thesis: *When Bayesian Learning Benefits Real-Time MI-EEG BCIs* — Advisor: Prof. Erika Parsons

B.S., Computer Science 2020–2022
Oregon State University — Corvallis, OR

B.S., Mathematics 2011–2015
University of Portland — Portland, OR

Research Experience

Graduate Researcher 2024–present
Smart Neurorehabilitation Ecosystem — University of Washington Bothell

- Researching uncertainty-aware deep learning for safety-critical AI systems.
- Designing and implementing a PyTorch/Pyro framework to evaluate Bayesian learning benefits and enable uncertainty quantification in real-time MI-EEG brain–computer interfaces (BCIs).
- Contributed software engineering expertise to guide project direction, lead lab meetings, and maintain milestone progress.
- Authored comprehensive documentation to onboard new team members and improve reproducibility across EEG/BCI research pipelines.

Technical Reports

[1] Ethan Davis. *Data Structures and Algorithms*. Zenodo, Oct. 2025. URL: https://doi.org/10.5281/zenodo.17297422.

[2] Ethan Davis. *Exploration-Exploitation-Evaluation (EEE): A Framework for Metaheuristic Algorithms in Combinatorial Optimization*. 2025. arXiv: 2510.05027 [cs.NE]. URL: https://arxiv.org/abs/2510.05027.

[3] Ethan Davis. *High Performance Matrix Multiplication*. 2025. arXiv: 2509.04594 [cs.PF]. URL: https://arxiv.org/abs/2509.04594.

[4] Ethan Davis. *Linear Algebra for Image Compression*. Mar. 2025. URL: https://doi.org/10.5281/zenodo.17180358.

Software & Reproducibility

[1] Ethan Davis. *davisethan/aco: Badge release*. Version v1.0.2. Oct. 2025. URL: https://doi.org/10.5281/zenodo.17274214.

[2] Ethan Davis. *davisethan/data_structures_algorithms: DOI release*. Version v1.0.2. Oct. 2025. URL: https://doi.org/10.5281/zenodo.17289626.
[3] Ethan Davis. *davisethan/eigenface: DOI release*. Version v1.0.1. Oct. 2025. URL: https://doi.org/10.5281/zenodo.17299529.
[4] Ethan Davis. *davisethan/gemm: DOI release*. Version v1.0.1. Oct. 2025. URL: https://doi.org/10.5281/zenodo.17299758.
[5] Ethan Davis. *davisethan/triangle_counting: DOI release*. Version v1.0.1. Oct. 2025. URL: https://doi.org/10.5281/zenodo.17299086.

Teaching & Mentoring

Teaching Assistant 2025–present
Computer Science Courses — University of Washington Bothell

- Assisting Prof. Erika Parsons in updating the course Mathematics for Machine Learning, including curriculum design, textbook selection, and assignment development and grading.

Selected Industry Experience

Software Engineer 2022–2024
SeekOut — Bellevue, WA

- Built ETL pipelines with Azure Functions, Blob Storage, Queue Storage, and Cosmos DB.
- Redesigned legacy pipelines using UML, OOD, and SOLID principles, improving maintainability.
- Applied Apache Spark/Databricks to scale data processing for larger datasets.

Software Engineer 2017–2020
Independent Project — Seattle, WA

- Built image-sharing web app using Java, Spring Boot, Node.js, and AWS Lambda.
- Applied distributed systems principles with AWS, Kubernetes, and microservices.

Software Engineer 2015–2017
StackBrew — Redmond, WA

- Built AST interpreter for JavaScript in Node.js, extended as C++ addon to improve speed.
- Developed backend microservices in Node.js/Go with MongoDB, deployed on GCP.

Conference Posters

- "Bayesian Deep Learning for Electroencephalogram Signal Recognition," *PUMPS+AI ACM Europe Summer School*, Barcelona, ES, July 2025. Poster

Certifications

PUMPS+AI ACM Europe Summer School July 2025
Statement of Accomplishment in CUDA workshops — Verify