Ethan Davis
davise5@uw.edu ● Seattle, WA ● Website ● Scholar ● GitHub

Education
M.S., Computer Science *University of Washington* — Seattle, WA, 2024–2026
B.S., Computer Science *Oregon State University* — Corvallis, WA, 2020–2022
B.S., Mathematics *University of Portland* — Portland, OR, 2011–2015

Experience
Master Thesis *University of Washington* — Seattle, WA, 2024–present

Evaluated when Bayesian ML improves motor-imagery EEG (MI-EEG) brain–computer interface (BCI) classification.
Benchmarked frequentist and Bayesian models across linear, Riemannian, and deep learning MI-EEG classifiers.
Implemented Laplace, variational inference, and Hamiltonian Monte Carlo to study accuracy–efficiency tradeoffs.
Tested Gaussian, Laplace, and Cauchy priors to assess effects of tail heaviness on expressiveness and calibration.
Analyzed discrimination, calibration, and sharpness, plus metrics such as Hessian condition number, ELBO, and ESS.
Used MOABB datasets and benchmarking for reproducible BCI research and statistically valid model comparisons.

Graduate Researcher *University of Washington* — Seattle, WA, 2024–present

Implemented ant colony optimization for TSP in Java/Hadoop MapReduce with AWS cluster deployment documentation.
Developed and benchmarked high-performance GEMM in CUDA, OpenMP, and C++ Threads vs. CuBLAS/BLAS.
Authored proofs and C implementations of EVD, SVD, QR, and power methods, using loop fusion for numerical stability.
Wrote 400-page DSA textbook featuring 120+ problems, software solutions, unit tests, and complexity analyses.
Implemented triangle counting in Apache Spark for graph community detection with AWS cluster setup documentation.
Applied metaheuristic optimization and numerical computing to bridge systems engineering with ML foundations.

Software Engineer *SeekOut* — Bellevue, WA, 2022–2024

Developed ETL pipelines to integrate ATS data into centralized data sink for search indexing using C# .NET and Azure.
Contributed to integrations for high-value accounts ($1M+), ensuring reliable, high-performance data ingestion at scale.
Produced UML, documentation, and unit tests to enforce maintainable, SOLID software design for scalable services.

Software Engineer *Independent Project* — Seattle, WA, 2017–2020

Designed and implemented a scalable image-sharing platform using Java Spring microservices, Docker, and Kubernetes.
Built reproducible AWS cloud infrastructure with Terraform for provisioning, Ansible for config, and MongoDB and S3.
Developed a React.js frontend with full CRUD, deployed via Node.js web servers in Docker containers on Kubernetes.

Software Engineer *StackBrew* — Redmond, WA, 2015–2017

Developed core micro-services, including a JS AST interpreter (Node.js/C++ addon) for real-time variable inspection.
Built a git-based micro-service for version control and automated CI/CD, streamlining development workflows.
Implemented collaborative editor micro-service using CRDTs with Node.js, Go, MongoDB, Docker, Kubernetes, and GCP.

Projects
Metaheuristic Algorithms: Developed a three-stage framework applying ant colony optimization to combinatorial problems with exploration, exploitation, and evaluation, demonstrated on TSPLIB berlin52. GitHub — Paper
Matrix Multiplication: Compared performance of five matrix multiplication implementations (CuBLAS, CUDA, BLAS, OpenMP, C++ Threads) for large N×N matrices, showing statistically significant FLOPS differences. GitHub — Paper
Data Structures and Algorithms: Authored a 400-page DSA textbook presenting problem categories, solutions, and complexity analysis, providing a framework for recognizing patterns and selecting optimal strategies. GitHub — Paper

Skills
Python, C++, C#, PyTorch, CUDA ● Spark/Databricks, SQL ● Azure (Functions, Blob, Cosmos) ● Docker, Kubernetes

Teaching & Mentoring
Teaching Assistant *University of Washington* — Seattle, WA, 2025–present

Assisted MS advisor in updating Mathematics for Machine Learning course curriculum, materials, and lecture design.
Surveyed leading ML textbooks (Duda et al., Bishop, Deisenroth et al.) to recommend optimal teaching resources.
Drafted lecture schedule and slides on core math for linear algebra, vector calculus, probability, and optimization.

Research Mentor *University of Washington* — Seattle, WA, 2025–present

Authored comprehensive onboarding documentation reducing new researcher ramp-up time from 3+ months to 1 week.
Centralized key BCI and ML resources, experiment design guides, and software references for lab-wide accessibility.
Established standardized, statistically valid BCI benchmark procedures aligned with stateof-the-art Riemannian models.

Conference Posters
Research Poster - PUMPS+AI ACM 2025.

Certifications & Training
Statement of Accomplishment - CUDA workshops of PUMPS+AI ACM 2025.