Noah Trupin

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Education

Purdue University — West Lafayette, IN
Bachelor of Science in Computer Science (Honors) — *August 2023 – May 2026*
Minor in Mathematics

Awards: Computer Science Endowment Scholarship

Relevant Coursework: Intro to Artificial Intelligence, Intro to Relational Database Systems, Data Structures & Algorithms, Systems Programming, Computer Architecture, Competitive Programming I and II, Abstract Algebra

Experience

Software Engineer Intern — Summer 2025
Capital One — *McLean, VA*

Undergraduate Research Assistant — August 2024 – Current
Cognitive Robot Autonomy and Learning Lab at Purdue University — *West Lafayette, IN*

- Trained a physics-informed neural network on 40,960 synthetic objects labeled via simulation in NVIDIA Isaac Lab, used to provide physical grounding for vision-based grasp and trajectory planners.
- Implemented OpenCV image processing and PyTorch inference pipeline for dynamic grasp detection with ggcnn.
- Developed high-performance state machines on Warp kernels and Fabric to execute tasks to generate datasets.

Undergraduate Teaching Assistant — January 2025 – Current
Purdue University Department of Computer Science — *West Lafayette, IN*

- Hosted two labs and two office hours sessions per week, offering lessons and guidance to 686 enrolled students.
- Graded weekly homework assignments, providing feedback for 300+ students each week.

Undergraduate Research Assistant — October 2023 – March 2024
Yang Group at Purdue University — *West Lafayette, IN*

- Researched scalable, parallelizable adaptations of classic algorithms for solving linear systems involving large sparse matrices for use in seismic tomography on Purdue's Bell Computing Cluster.
- Implemented a parallel conjugate gradient routine in Fortran with OpenMP and OpenMPI, achieving a 29.2% improvement in runtime and 70.5% decrease in memory usage over previous solution across test batches.

Founding Engineer — April 2023 – November 2023
Straato — *Ithaca, NY (Remote)*

- Designed and implemented backend for an experimental trading environment, including user onboarding and PayPal-integrated transactions, on top of an AWS (EC2, S3, Cognito, Lambda, etc.) and MySQL stack in Python.
- Developed landing, signup, and login pages using ReactJS and TailwindCSS.
- Facilitated partnership with Cornell Blackstone Launchpad, gaining financial and mentorship support.

Projects

noahgrad, a neural network library from scratch | *Python*

- Developed a machine learning library complete with tensors, autodiff, backpropagation, loss functions, optimizers, extensible modular layers, and activations for building neural networks in Python with NumPy.
- Constructed and trained classic networks such as XORNet, GPT-2, and image classification MLPs using library.

Sentinel: Full-stack NodeJS framework for students to create interactive simulations, paired with a mobile web app.
Text-to-Image VAE: BERT embeddings and from-scratch conditional variational autoencoder, PyTorch.
Hexdump Utility: Command-line hexdump featuring colored output, buffering, and side-by-side text written in C.
Lambda Calculus: Compilers and interpreters for the lambda calculus in C, Rust, Go, Mathematica, and JavaScript.
Personal Website: Full-stack Flask/PostgreSQL website where I edit and display my projects, writing, and info.
Lore Browser iOS App: iOS app to search/read Destiny 2 lore by scraping the Ishtar website, written in Swift.

Technical Skills

Proficient Languages: C, C++, Fortran, Python, Java, SQL, Swift, Ruby, JavaScript, Bash, R
Related Technologies: AWS, Google Cloud, Docker, Jupyter, Linux, SLURM, Git, GitHub CI/CD, OpenMP, CUDA
Relevant Libraries: PyTorch, MLX, NumPy, Matplotlib, Pandas, OpenMPI, Flask, NodeJS