Noah Trupin

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EDUCATION

Purdue University — West Lafayette, IN
Bachelor of Science in Computer Science (Honors); GPA: 3.86 — *August 2023 – May 2027*
John Martinson Honors College, Minor in Mathematics

Awards: Computer Science Endowment Scholarship

Relevant Coursework: Intro to Artificial Intelligence (Fall 2024), Probability (Fall 2024), Data Structures & Algorithms, Elementary Linear Algebra, Programming in C, Foundations of Computer Science (Discrete Math), Object-Oriented Programming (Java), Data Mine Seminar (Data Science)

EXPERIENCE

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

- Researched a scalable, parallelizable algorithm 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 transactions, on top of an AWS (EC2, S3, Cognito, Lambda, etc.) and MySQL stack in Python and ReactJS.
- Developed landing, signup, and login pages using ReactJS and Tailwind.css.
- Facilitated partnership with Cornell Blackstone Launchpad, gaining financial and mentorship support.

POSTERS & PRESENTATIONS

N. Trupin, X. Yang. A Parallel Conjugate Gradient Routine for Non-Square Matrices. February 2024

W. Phillips, **N. Trupin**, S. Laubach. Paradigm for Future Analysis of Shipetaukin Creek Water Quality, Winter 2022 Lawrenceville Poster Night. May 2022

PROJECTS

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

- Developed a machine learning library complete with tensors, autodiff, backpropagation, loss functions (cross entropy, mean squared error, etc.), optimizers (SGD, Adam, etc.), extensible modular layers (linear, dropout, norms, etc.), and activations (ReLU, Tanh, etc.) 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, an interactive physics simulation framework | *JavaScript (Client + NodeJS)*

- Developed and deployed a full-stack framework for physics students to create interactive simulations.
- Provided interactive orbital, raytracing, and pachinko simulations as proofs-of-concept.
- Implemented ability for users to select and interact with simulations using a web app on their phones by scanning an on-screen QR code.

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, Python, Java, SQL, Swift, Ruby, JavaScript, R, Fortran
Related Technologies: AWS, Google Cloud, Docker, Jupyter, Linux, SLURM, SQL Databases, GitHub CI/CD
Relevant Libraries: PyTorch, MLX, NumPy, Matplotlib, Pandas, OpenMPI, Flask, NodeJS