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: CS471 Intro to Artificial Intelligence (Fall 2024), MA416 Probability (Fall 2024), CS251 Data Structures & Algorithms, MA351 Elementary Linear Algebra, CS240 Programming in C, CS182 Foundations of Computer Science, CS180 Object-Oriented Programming (Java)

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 across test batches.

Founding Engineer April 2023 – November 2023

Straato *Ithaca, NY*

- Inaugural member of Straato, a software startup building an experimental digital currency and marketplace.
- Designed and implemented marketplace backend, 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 React.js 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, optimizers, and modular layers for building neural networks in Python with NumPy as the sole dependency.
- Trained classic networks such as LeNet5 and SGD-based MLPs for image classification 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 at my school.
- 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.

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.
micrograd.c: a modified C version of Karpathy's micrograd. Supports feed-forward operations, autodiff, and backprop.
Personal Website: Full-stack Flask/PostgreSQL app 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 Could, Docker, Jupyter, Linux, SLURM, SQL Databases
Relevant Libraries: PyTorch, MLX, NumPy, Matplotlib, Pandas, OpenMPI, Flask, NodeJS