

# Noah Trupin

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## EDUCATION

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### Purdue University

*Bachelor of Science in Computer Science*

**Extracurricular Activities:** Undergraduate Research, ML@Purdue Member

**Relevant Coursework:** CS240 Programming in C, CS182 Foundations of Computer Science, CS180 Problem Solving and Object-Oriented Programming

West Lafayette, Indiana

August 2023 – December 2026

### The Lawrenceville School

*High School Diploma*

Lawrenceville, NJ

August 2019 – May 2023

## EXPERIENCE

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### Undergraduate Research Assistant

*Purdue University Yang Group*

October 2023 – Present

West Lafayette, IN

- Conducting research on scalable parallelization of the least-squares QR factorization algorithm in Fortran for solving linear systems involving large sparse matrices in seismic tomography under Professor Xiaotao Yang.
- Utilizing OpenMP and OpenMPI for parallelization and message-passing for multithreading of the algorithm on distributed compute nodes.

### Co-Founder, Consultant

*Straato*

May 2023 – Present

Remote - Ithaca, NY

- Acting as a consultant while studying at Purdue, corresponding with the team in Ithaca.
- Facilitated partnership with Cornell Blackstone Launchpad, gaining financial and mentorship support.

### Chief Software Engineer

*Straato*

May 2023 – September 2023

- Served as the inaugural Chief Software Engineer for Straato, a New Jersey-based software startup building a new type of digital currency and marketplace.
- Designed and implemented Straato's marketplace backend, including user onboarding and transactions, on top of an AWS (EC2, S3, Cognito, Lambda, etc) and MySQL stack in Python and ReactJS.

### High School Research Assistant

*The Lawrenceville School & The Stroud Water Research Center*

December 2021 – May 2022

Lawrenceville, NJ

- Created models to predict the behavior of endangered rivers in Lawrence Township and inform land management decisions using current and historical mid-Atlantic water quality data.
- Generated predictive regressions with Numpy and visualizations with Matplotlib using observations matrices produced from historical and current sensor data.

### Honors Computer Programming Teaching Assistant

*The Lawrenceville School*

September 2021 – May 2022

Lawrenceville, NJ

- Served as an assistant in MA555: Honors Computer Programming.
- Guided students through learning the Wolfram Language, Mathematica, and foundations of technical computing.
- Designed and presented multiple follow-along demonstrations and lessons involving simulations, distributed systems, user interfaces, and programmatic solutions to mathematical problems.

## PROJECTS

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### nohex(1), a hexdump(1) replacement | Personal | C, Fortran

July 2023

- Developed a hexdump utility in C (with a port to Fortran) with improved formatting over hexdump(1), colored output, and side-by-side hexadecimal and ASCII output.
- Implemented many of hexdump(1)'s flags for compatability as a drop-in replacement and improvement.

### ntrupin.com | Personal | Python, Flask, Postgres, JavaScript

July 2018 – Present

- My full-stack personal website, complete with login, dynamic pages, posts, projects, an RSS feed, and more.
- Backend: Python and Flask with Jinja2 for templating, Postgres as a database, and Werkzeug for authentication.
- Frontend: Vanilla HTML/CSS/JavaScript with Pico.css for base styling and highlight.js for syntax highlighting.

- Hosting: Database on Heroku, server on Vercel.

**sentinel.lawrenceville.org** | Lawrenceville | *Node.js, JavaScript, p5.js/Processing* March 2023 – June 2023

- Worked with Dr. Keith Voss on Sentinel, the Lawrenceville School's internal extensible utility.
- Developed a full-stack Node.js and WebSocket-based framework and API for students to build interactive web-based simulations using JavaScript and p5.js/Processing.

**Orbital & Raytracing Simulations** | Lawrenceville | *JavaScript, Sentinel, p5.js* March 2023 – May 2023

- Developed orbital and optical simulations on top of custom physics engines as proofs-of-concept for Sentinel.
- Orbital Simulation: Modeled the effects of a large impact on the Moon's orbit via a Newtonian mechanics simulation, complete with a sidebar containing continuously-updating statistical information.
- Raytracing Simulation: Explored geometric optics via raytracing on a 2D plane with convex and concave lens to help students visualize the relationship between object placement, focal length, and lens type in creating real and virtual images. Allowed students to modify variables from their mobile devices.

**thelawrence.lawrenceville.org** | Lawrenceville | *Ruby, Rails, Postgres, JavaScript* October 2021 – March 2023

- The website for Lawrenceville's student-run publication, the second oldest weekly high school publication in the United States. Trained and led a team of student developers to maintain the website.
- Developed a full-stack website complete with articles, issues, author pages, search functionality, editor login, an article editor, and an author manager with Ruby on Rails.

**Tutor Matching System** | Lawrenceville | *JavaScript, GSuite API* September 2021 – February 2022

- Designed and implemented a robust request management system that integrates multiple Google GSuite utilities (Sheets, Forms, and Mail) to streamline the request, triage, and response process for tutors and students at Lawrenceville using JavaScript/Apps Script subset.

**Lore Browser iOS App** | Personal | *Swift, iOS SDKs/APIs, Web Scraping* October 2021 – November 2021

- Developed an iOS app enabling users to read and search the Ishtar Collective (Destiny 2 lore).
- Utilized SwiftUI for views, Combine for state management, and SwiftSoup for web scraping.

## VOLUNTEERING

**Lead Web Developer** Dec 2021 – May 2022

*MEGA League*

*Princeton, NJ*

- Lead a scrum team to develop the initial website for MEGA, featuring hackathon information and a signup portal.
- Organized MEGA's inaugural hackathon, attended by hundreds of students virtually and in-person from over 20 US and international schools.
- Facilitated partnerships with over 30 schools and NGOs to bring speakers, prizes, and opportunities to in-person and remote participants.

**Teacher** Nov 2021 – Mar 2022

*CodeItForward*

*Lawrence, NJ*

- Taught internet literacy and the basics of web development to elementary and middle school students from under-resourced schools in the Lawrence Township area.
- Designed and executed weekly lesson plans that taught participating students valuable skills in engaging ways.
- Guided students through publishing a personal webpage to a private site for them to visit and show their friends and families, tying together the internet and web development skills taught throughout the program.

## PUBLICATIONS

**N. Trupin**, K. Voss. Sentinel: An Interactive Simulation Framework, Spring 2023 Lawrenceville Poster Night. Solution implemented on displays in Lawrenceville's Kirby Math and Science Center. May 2023

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

**N. Trupin**, M. Bayona\*. Applications of Mathematica for Optical Music Recognition, Spring 2022 Lawrenceville Poster Night. Prototype implemented in Mathematica. May 2022

## TECHNICAL SKILLS

**Languages:** C, Python, Java, SQL (Postgres, MySQL), Ruby, JavaScript, HTML/CSS, R, Fortran

**Technologies:** Git, Docker, AWS, Google Cloud, Jupyter, Linux

**Frameworks & Libraries:** PyTorch, NumPy, Matplotlib, OpenMP, OpenMPI, React, Node.js