Nathanael Lu

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Education

University Of Michigan **Ann Arbor, MI**

BSE in Computer Science, BS in Honors Mathematics May 2026

- GPA: 4.00/4.00
- Coursework: Data Structures & Algorithms, Computer Organization, Statistics, Linear Algebra, Differential Equations

Work Experiences

Software Development Engineer Intern **Lake Orion, MI**

American Battery Solutions Mar. 2024 – Oct. 2024

- Actively maintained and developed an internal tool used by **50+** employees for battery testing and validation.
- Added data visualization capabilities to the Battery Management System built with **Flask**, using **Polars** and **Seaborn** to plot temporal heatmaps for battery cell data leading to a **33%** increase in pre-production anomaly detection.
- Implemented file caching and automated system format detection, leading to a **93%** reduction in redundant storage.
- Introduced wildcard callbacks to support analysis involving multiple products to increase validation efficiency by **65%**.

CTO **Ann Arbor, MI**

LetsPark Jun. 2024 – Present

- Led two teams to develop a client **IOS** application using **Flutter** and an admin panel using **Next.js**, implemented authentication with **Firebase** and **Google Cloud** for Maps SDK, Places API, and distance matrix calculations.
- Designed an API leveraging **MongoDB** geospatial queries for an **80%** decrease in spot-matching time.
- Architected a load-balancing **AWS EC2** backend and CDN, utilizing **Cloudflare** proxying with **99%** uptime.
- Developed a NextJS web application using **Google Analytics** to automate lead tracking increasing conversions by **30%**.

Skills

Programming Languages: C++, Python, Dart, Javascript, Typescript, SQL, HTML, CSS, R, Rust

Technologies: Git, Flutter, React.js, Next.js, Node.js, Dash, Pandas, Firebase, MongoDB, Redis, Tailwind, Expo, Docker

Programming Projects

Botris-Interface (Python, C++, PyPI, GitHub Actions, CICD) Sep. 2024 – Dec. 2024

- Prototyped a **Python library** for a Tetris AI tournament that enabled 10+ developers to quickly develop powerful bots.
- Leveraged **GitHub Actions** to conduct **CICD** pipelines with verbose testing for over **75%** source code coverage.
- Used **Nanobind** to accelerate performance-critical systems embedded in Pythonic class interface for ease of use. Compiled cross-platform binaries on the cloud using **CIBuildWheel** for consistently compatible distributions.

Optiver Kaggle Lead (Python, Tensorflow, Pandas) Oct. 2023 – Nov. 2023

- Directed a team in a Kaggle competition to identify trading opportunities related to closing price movement, utilizing an ensemble of models with **TensorFlow** to achieve predictions with **87%** accuracy with only 5 GPU hours of training.
- Advanced predictive modeling through hyperparameter optimization using Optuna and Neptune.ai, and leveraged Pandas for sophisticated data manipulation, resulting in enhanced feature engineering and model performance.

Neurosity Crown Lead (Javascript, React Native, Expo, Node.js, Firebase) Oct. 2023 – Mar. 2024

- Created an AI-based EEG analysis tool utilizing Neurosity Crown; architected and implemented a **React Native** mobile application designed using **Figma**, integrating **Expo** frameworks and **Firebase** for multi-factor authentication.
- Utilized Agile software development to ensure efficient project management, following a strict timeline within collaborative, cross-disciplinary teams and employing Scrum methodologies to meet project deliverables.

Liravis Lead (C++, libPCL, Git, LiDAR, Python, ROS2) Oct. 2023 – Mar. 2024

- Orchestrated a collaborative initiative between the AI Club and Autonomous Vehicles Club to develop an open-source library fusing LiDAR, Radar, and Computer Vision for enhanced autonomous navigation, 2x the analytical capability.
- Managed 10 students in the deployment of advanced computer vision algorithms for precise traffic sign recognition and real-time vehicle localization, elevating the project to a benchmark for efficiency in autonomous vehicle research.