

Matthew (Zekun) Liu

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Education

University of Toronto – BSc in Computer Science

Expected Graduation January 2026

Artificial Intelligence Specialist Program, Arts and Science Internship Program, Dean's List Scholar

Key Competencies

JavaScript: (2 YOE) TypeScript, React, Next.js, Express, Prisma, BullMQ, Tailwind, Bootstrap, Chakra, HTML, CSS

Python: (4 YOE) Flask, Django, FastAPI, LangChain, NumPy, Pandas, Matplotlib

Java: (2 YOE) **C/C++:** (1 YOE) **Databases:** Postgres, SQLite, MySQL, redis **Authentication:** JWT, OAuth

DevOps: Docker, Kubernetes, Helm Charts, IBMCloud, LogDNA/Mezmo, NATS, Git, GitHub Actions

Work Experiences

IBM – Full Stack Software Development Intern

Jan 2024 – Aug 2024

- Enhanced and maintained the backend of IBM's educational labs system which sees over 2500 Kubernetes environments created everyday, serving over 7 million learners and 150 companies
- Upgraded the TypeScript NATS messaging library to improve type safety between microservices and simplify error reporting
- Improved CI/CD processes by engineering a method to build oversized docker images on GitHub Actions runners, saving the team thousands of dollars by averting the need to self host runners
- Redesigning the Kubernetes and IBMCloud environment provisioner to improve stability, error handling, and developer experience through modular, type safe design centered around a BullMQ job queue
- Enhanced IBM's Cloud IDE by linking its integrated databases to an external database manager, reducing database start up failure rate by 90% and start up delay by 70%
- Repaired broken courses that used serverless functions and maintained IBMCloud services during significant API changes
- Improved UI/UX for lab applications and tools built using React, Tailwind, Handlebars.js, HTML/CSS, and Jinja2 templates

UNICEF – Project Intern

Sept 2023 – Dec 2023

- Built a reach application to facilitate the assessment and selection of open-source data, models, software, and content collections for UNICEF employees worldwide
- Linked the React frontend with a Django REST Framework backend, and contributed to database and API design
- Implemented the form feature on the frontend with Tailwind and polished UI/UX

Onova – Full Stack Software Development Intern

May 2023 – Dec 2023

- Built an enterprise hackathon management software with React, Next.js, and TypeScript, which was adopted by Capgemini to host an internal Gen AI hackathon with over 1000 participants from around the world
- Built major frontend features such as the judging interface, the user directory, the team interface, and the search bar
- Optimized app performance by implementing pagination, connection pooling, and other improvements
- Owned API and database design for the entire app and migrated the application to use Prisma ORM.
- Built a ChatGPT powered poker coach using React, Next.js, TypeScript, and Radix-UI on the frontend; while using Python, FastAPI, LangChain, and OpenAI Functions on the backend
- Conducted independent research and experimentation on AI technologies such as RAG with Pinecone DB, LangChain, OpenAI Functions, and OpenAI Threads to improve speed, accuracy, and cost

Projects

ParallelMake

Mar 2023 – Apr 2023

- Programmed a clone of Make in C which parallelizes the workload into sub-processes to achieve 30% faster compile times
- Programmed a socket listener to allow commands to be sent remotely from another computer on the same network
- Extended the project by implementing optional GitHub integration for automatically cloning and compiling repositories