

# Youzhang (Mark) Sun

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## OVERVIEW

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- **Languages:** Haskell, Python, Java, JavaScript, TypeScript, C, C++, SQL, Rocq, HTML, CSS
- **Technologies:** Node.js, React, React Native, Nest.js, Prisma, LLVM, Git, Linux, SQLite, GHC, Haskell cabal
- **Concepts:** Web Services, REST APIs, Database Integration, Authentication, Software Testing, Automation, Compiler Design, Data Modeling, Functional Programming, Formal Methods, Proof Assistants

## WORK EXPERIENCES

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### dApp Technology Inc.

Fullstack Software Engineer Co-op

Toronto, Canada

Jan 2022 - Aug 2022

- Contributed to the development of a blockchain wallet app with a novel decentralized recovery system using smart contracts.
- Built and tested REST APIs with capacity for **1000+ requests per minute** using Node.js, Nest.js and PostgreSQL.
- Integrated WalletConnect features into the frontend client, reducing reliance on central data processing. Improving **user trust and scalability** as a result.
- Implemented frontend account recovery UIs. Maintained consistent styling by using reusable React Native components.

### TD Securities (TD Bank)

Software Engineer Co-op

Toronto, Canada

Jan 2021 - Apr 2021

- **Enhanced data visibility** by automating 3 data-analytic report generation and delivery workflows using Java Spring, Python, and MS SQL Server.
- Simplified a transaction compliance verification routine by automating the process with a Python script. Reducing human errors and cut verification time **from minutes to seconds**.
- Identified and corrected a critical error in currency exchange calculation affecting **100,000+ data points**.

### University of Toronto

Teaching Assistant

Toronto, Canada

May 2021 - Dec 2025

- **Developed course materials** for undergraduate courses in programming language theory using Haskell and Racket.
- Automated assignment grading for 300+ unique submissions using a mix of unit tests and property testing. **Reduced turnaround time by 50%**.
- Led 50+ tutorial sessions for groups of 30+ students, praised by students for effective teaching.
- Implemented a compiler for a C-like procedural programming language using C++ and LLVM.

## SIDE PROJECTS

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### Lodestone

Project Link: <https://github.com/Lodestone-Team/lodestone>

Jan 2022 - Dec 2022

- Co-designed and developed a self-hosting video game server service with **1000+ stars** on GitHub.
- Implemented persistent logging solution using SQLite and sqlx, with capacity for **100+ incoming logs per second**.
- Improved **developer experience** by implementing a CLI for the backend server.
- **Prototyped** hardware monitoring frontend using React and Chart.js.

### Hike

Project Link: <https://github.com/YZmarkS/Hike>

Aug 2026 - Present

- Implemented **correct-by-construction** HTTP web service, identifying incorrect handler-endpoint binding at compile-time.
- Eliminated a class of runtime SQL bugs by adopting **persistent**, a type-safe backend data serialization library.
- Implemented **proper authentication** practices such as salting, hashing, and JWT access.
- Ensured maintainability by keeping up-to-date documentations on design decisions and implementation details.

## EDUCATION

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### University of Toronto

Master of Science

Computer Science

Toronto, Canada

Sept 2024 - Jun 2026

Cumulative GPA: 3.93/4.00

- **Formalized and verified a type inference algorithm** for functional programming languages with support for advanced language features such as polymorphism, let-generalization and Generalized Algebraic Datatypes (GADTs).
- Investigated improvements to languages with support for algebraic effects and effect handlers.

### University of Toronto

Honour Bachelor of Science

Double Major in Computer Science and Mathematics

Toronto, Canada

Sept 2019 - Jun 2024

Cumulative GPA: 3.98/4.00

- Recipient of the **2023 Computer Science Theory Award**, presented annually to the student with the highest average in computer science theory courses in the past year.
- Recipient of the **Dean's List** honours from **2020 to 2023**, presented to students with GPA of 3.50/4.00 or higher.
- Achieved final grade of **100%** in 4 mandatory courses in computer science and mathematics.