

Matthew Au-Yeung

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EDUCATION

University of Waterloo

Waterloo, ON

Bachelor of Computer Science, Honours Co-op — GPA 3.8

Sept 2022 – Apr 2027

Courses: DSA, Operating Systems, Distributed Systems, Concurrency, Compilers, Cryptography & Security, Databases

SKILLS

Languages: Java, Go, Rust, Python, Kotlin, TypeScript, C#, Elixir, C/C++

Tools and Frameworks: Spring, gRPC, Raft, ASP.NET Core, Auth0, Nix

Databases and Cloud: PostgreSQL, Microsoft SQL Server (MSSQL), Docker, GitHub Actions

EXPERIENCE

Atomic Semi

May 2026 – Aug 2026

Incoming Software Engineer Intern – Fab Management Software

San Francisco

Mechanical Orchard

Jan 2026 – Apr 2026

Software Engineer Intern

Remote

- Developed a **COBOL compiler and runtime** in **Java** with native SQL and transaction processing, validated against **500+ mainframe programs** for behavioural accuracy
- Built a **concolic testing engine** paired with a compiler-fed LLM for fuzzing and path prioritization, producing **100% line-coverage** test suites in **minutes** that fully validate Java rewrites of COBOL

University of Waterloo

Sept 2025 – Apr 2026

Compilers Research Assistant

Waterloo, ON

- Patched the **Cforall** compiler, a language extending C with native concurrency primitives, resolving method linking errors and concurrent destructor deadlocks
- Engineered **Cforall** programs to validate concurrency abstractions, including **threads**, **monitors**, and **actors**

Mechanical Orchard

May 2025 – Aug 2025

Software Engineer Intern

Remote

- Developed a **Java** type system replicating **COBOL** variable behavior, improving LLM rewrite accuracy by **80%**
- Modernized **2 mainframe applications** serving inventory for **1K+ stores** using **Java**, **Spring**, and **gRPC**

Ford Motor Company

Jan 2025 – Apr 2025

Software Developer Intern

Waterloo, ON

- Built a **Kotlin Android service** capturing Apple CarPlay button telemetry for **5 vehicle UX teams**
- Increased mobile projection test coverage from **70% to 83%** using **Coroutines**, **JUnit**, and **Robolectric**

University of Waterloo

May 2024 – Jan 2025

Compilers Testing Research Assistant

Waterloo, ON

- Engineered a MIPS assembly interpreter and graphical debugger in **Kotlin** used annually by **over 1,000 students** to debug compiler outputs (bit.ly/4gfQ7sh)
- Created an **ANTLR** grammar and parser to normalize and compress source files across **5 languages**

Township of Centre Wellington

May 2024 – Aug 2024

Software Developer Intern

Fergus, ON

- Shipped a document portal tracking **1K+ locations** using **C# ASP.NET Core**, **TypeScript**, and **MSSQL**
- Improved communication for **100+ officials** by building shared notes using **SignalR Websockets** and **Quill.js**

PROJECTS

Distributed Go Channels — Go, gRPC, hashicorp/raft

[m4tth3/dchan](https://github.com/m4tth3/dchan)

- Created a **Go** library providing **native channels** for many-to-many distributed messaging over **Raft** and **gRPC**
- Reduced message latency by building a **gRPC-based Raft Transport** that shares long-lived connections