Shihan Sharar

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Education

University of Waterloo — *Waterloo, ON*
Bachelor of Computer Science (Coop) — *Sept 2023 - Aug 2028 (Expected)*

- **Dean's List** (all terms); CGPA: **94%**, Faculty GPA: **96%** (with enriched courses)
- **Skills**: React, C++, C, Python, Typescript/Javascript, Node.js, Next.js, CSS, Figma

Experience

University of Waterloo — *Waterloo, ON*
Undergraduate Research Assistant — *May 2025 - Present*

- Developing secure-world **C++** applications to monitor and enforce control-flow integrity of **LLM agents** on an emulated Android TEE under Professor Nadarajah Asokan.

Ford Motors Canada — *Ottawa, ON*
Platform Software Developer - Provisioning — *Jan 2025 - Apr 2025*

- Boosted unit-test coverage for the provisioning component from **95.0%** to **99.6%** line coverage and from **92.5%** to **98.7%** decision coverage using **C++** and **GTest/GMock**, while driving code-duplication down from **0.5%** to **0%**.
- Engineered a helper class for async invocation of component-proxy methods, boosting service responsiveness.
- Integrated **Valgrind** & **sanitizer** tooling into the **Python**-based functional-test suite, automating detection of CPU bottlenecks & memory leaks, and analyzing the resulting logs to eliminate **20+** issues.
- Eliminated **120+** code smells and slashed duplication from **20%** to **0%** for the Android provisioning component.

InsightIn Technology — *Dhaka, Bangladesh*
Software Engineering Intern — *Jul 2024 - Aug 2024*

- Designed **5+** responsive web pages in **Figma** and implemented them using **React/TypeScript**, boosting runtime performance by **~30%** through use of React hooks and memoization.
- Built a library of table-based **HTML** email templates with inline **CSS**, executing full-suite **Litmus QA** to ensure delivery across all major desktop and mobile clients.

Clubs

University of Waterloo Robotics Club — *Waterloo, ON*
Embedded Software Engineer — *May 2025 - Present*

- Engineering bare-metal **C** drivers on an **STM32 microcontroller** to produce real-time 6-axis **IMU** data for rover joint inclination with sub-degree precision.
- Implementing a **C++ ROS** node to process and filter raw IMU data for 6-DOF orientation estimation and publish live transforms for **RViz** visualization.

Projects

RAIlnet: C++ Multiplayer Strategy Game

- Engineered a **C++** strategy game by applying **MVC** architecture, **SOLID** principles (SRP), and the **Observer** pattern to decouple core logic from both text-based & **X11** graphical interfaces.
- Scaled gameplay to 2- and 4-player modes with dynamic board layouts, automated elimination cleanup, and separate display windows per player, enforcing strong exception safety and leak-free execution via smart pointers.

The Jobster API: MERN Job-Tracking Platform

- Engineered a **React** frontend, leveraging **Recharts** for job-application analytics, and an **Express** backend with secure authentication, searching, sorting, and filtering capabilities.
- Integrated **MongoDB** as the database layer and **Mongoose** for data modeling.

ByteCraft: Next.js/React Blog

- Built a full-stack **Next.js/React** blog with server-side rendering, delivering fast load times.
- Engineered a cookie-driven dark-mode toggle to persist user theme preferences across sessions.