Awab Q.

Site: *awabq.com* | LinkedIn: *awabq* | Github: *aaqsr* | Email: *awab.qureshi@uwaterloo.ca*

Skills

Languages	C, C++, Python, System Verilog, JavaScript/TypeScript, LISP, ARMv7, Bash, Rust
Technologies	Git, Linux, OpenGL, AWS, PostgreSQL, Fusion 360 CAD, AMD Vivado, Numpy/Pandas

Experience

Huawei | *Software Engineering Co-op* *Sep 2025 – Present*

- Research **compiler optimisations** for kernel Access Control Policies as part of the Data and Privacy Protection Technology Lab.

Christie Digital Systems | *Software Engineering Co-op* *Jan 2025 – May 2025*

- Characterised **computer vision** systems, automated manual correction and developed an optical testing framework with C++.
- Extended a critical binary encoder in C++ and **interfaced directly with projection hardware** to implement multi-colour features.
- **Researched solutions** to optical distortions, utilising Numpy, Pandas and Matplotlib to **analyse lab data** in Python, leading to improved camera calibration techniques and subpixel projector alignment.

University of Waterloo | *Software Engineering Instructional Support Assistant* *May 2024 – Sep 2024*

- Worked in **Linux server** environment to maintain course infrastructure with bash scripts, achieving a **high uptime** for users.
- Planned and **delivered weekly tutorials** on C++, object-oriented design, and software engineering to second-year SWE students.
- Ran frequent office hours to clarify course concepts, aid with assignment problems, and guide students about **safe C++** practices.

Expresume | *Full-Stack Web Developer Intern* *May 2023 – Sep 2023*

- Spearheaded **backend design** for an AI platform, leveraging PostgreSQL, and AWS services after evaluation of company needs.
- **Redesigned main frontend stack** to use Tailwind and NextJS server components, increasing code reuse with better performance.

Projects

Fluid and Rigid-Body Simulator [*awabq.com/488*] | *C++, GLSL*

- Developed **real-time, lock-free multithreaded physics engine** in C++ with quaternion-based rotation for arbitrary convex meshes.
- Implemented a large-scale, shallow **water simulation** using discretised fluid equations and adaptive time-stepping for stability.
- Coupled the water simulator with the rigid-body engine to enable **fluid-rigid body interaction**.
- Developed custom **OpenGL rendering pipeline** with optimised GLSL shaders implementing Blinn-Phong lighting, cube-map reflections, and geometry tessellation for continuous water surface rendering with optimal GPU utilisation.

Handheld Game Console | *C++, C*

- Developed for a Cortex-M core on an **STM32 MCU**, using a logic analyser and oscilloscope to debug and verify hardware behaviour.
- **Leveraged a 3D printer** to draft, rapidly prototype and iterate on a custom housing in AutoDesk Fusion.
- Created **SPI screen driver** improving latency, whilst optimising power consumption and maintaining real-time constraints.

Lambda Calculus Interpreter | *C, Lambda Calculus*

- Designed a **scanner, lexer, parser, and evaluator** for lambda calculus, with support for currying, variables, and avoiding capture.
- Enabled support for the **Y-combinator** and recursion by implementing alpha-beta reduction to lazily evaluate lambda expressions.
- Wrote a **custom linear memory allocator** for better memory management and cache locality, eliminating memory errors.

Activities

The Undergraduate Mathematics Society of UW | *President* *Sep 2024 – Jan 2025*

- **Led the organisation**, streamlining internal procedures, creating and building strong relationships with partners.
- Acted as the **primary representative for over 6,500 math students**, focusing on creating new events and inclusive club spaces.

mathNEWS | *Editor* *Sep 2023 – Present*

- Organise writing events, copy-edit submissions, and **publish over 700 copies fortnightly** of the campus-favourite publication.
- Collaborate with other editors to lay-out issues in Adobe InDesign, arrange professors' interviews, and coordinate with writers.

Education

University of Waterloo *Sep 2022 – Apr 2027*

Candidate for *Bachelor of Computer Science, Digital Hardware Specialisation*

Relevant Coursework: Graphics, Embedded and Digital Hardware Design, Concurrency, Compilers, OS, Data Structures & Algorithms.