

Will McIntyre

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Skills

Languages: C, C++, Python, Java, Assembly, MATLAB, SQL, JavaScript **Tools/Technologies:** CMake, OpenGL ES, RTOS (QNX, Zephyr), ROS2, Microcontrollers, OpenCV, Linux/UNIX, Bash, SLAM, Git, Pytorch, MQTT, SPI, I2C, UART, CAN, USB, TCP/IP, HTTP, Bluetooth, GitLab, Jira, AWS

Professional Experience

- Software Engineering Intern, Qualcomm Technologies, Inc** 05/2026 – 08/2026 | Boulder, CO, United States
- Developed **low-level embedded firmware** in **C** for power management features on **ARM**-based Snapdragon SoCs running **Zephyr RTOS**.
 - Reduced** thermal driver SRAM footprint by **54%** across targets by refactoring C firmware for memory optimization and updating Python generation scripts to remove duplicate register writes. Performed on-target hardware validation using **Lauterbach TRACE32**.
 - Architected and integrated a modular C initialization framework into the **Power Debug Processor** subsystem that replaces multi-instruction macros with single-address writes for standard register configuration across driver teams.
 - Designed a **custom image memory analysis tool** in **Python** for team of **over 300** engineers that outputs reports on ELF memory section breakdowns, static symbol footprints and individual file size contribution to hardware constraints.
- Software Engineering Intern, Ford Motor Company** 01/2026 – 05/2026 | Waterloo, ON, Canada
- Productionized the new real time **360° Birds Eye View** camera overlay to be released in **over 800 000** vehicles in 2027, built on **QNX** in **C++ 17**.
 - Engineered high-performance graphics using **OpenGL ES** to combine multi-camera feeds and real-time Advanced Driver Assistance Systems (**ADAS**) telemetry overlays smoothly onto the display.
 - Conducted **on-target debugging and profiling** on QNX hardware targets, ensuring deterministic performance for automotive standards.
- Mechatronics & Software Engineering Intern, AUG Signals** 05/2025 – 08/2025 | Toronto, ON, Canada
- Led **C++** firmware design and electromechanical updates in SolidWorks for a custom **Arduino** phosphate analyser. Produced a **±2%** accurate tachometer using **hall effect sensors**, improved temperature precision by **20%**, and built a custom **serial interface** for sensors over **I2C**.
 - Built a real-time **Vue.js** dashboard for a **Python** backend deployed using **Docker** to visualize **25+** water contaminant sensor streams.
 - Integrated a new **C**-based spectrometer API into a **Java** interface using **UART**, reducing port usage by **80%**.
 - Redesigned an **MQTT**-based communication pipeline between units and the central **PostgreSQL** database, cutting data throughput by **50%**.
- Software Engineer, Siteability** 02/2024 – 08/2025 | Waterloo, ON, Canada
- Supported early stage initiatives of a real estate development SaaS **startup** with over **\$40 000** of pre-seed funding.
 - Led the mapping engineering team in architecting a specialized design engine in a **Nuxt.js /Vue.js** application that enables users to draw and customize **over 100** ADU configurations in real time.
 - Implemented external **APIs** and internal data on over **47 000** homes to design **algorithms** for displaying relevant parcel data to developers.
- Full Stack Developer, Workplace Safety Insurance Board Innovation Lab** 09/2024 – 12/2024 | Toronto, ON, Canada
- Oversaw the backend development of a **REST API** using **Flask** for an **AI-powered** parsing app handling over **12,000 documents**.
 - Architected a relational database schema in **Microsoft SQL** on **Azure**, improving response time by **322%** through optimized query design.
 - Integrated **image processing** and used **OpenAI API** to automate document parsing, reducing total processing times to **<5 seconds**.
 - Developed a modular frontend using **React**, integrating the API to provide specialists with real-time access to documents and insights.
- Performance Test Developer, NCR Voyix** 01/2024 – 05/2024 | Waterloo, ON, Canada
- Engaged with the Passport digital banking team, contributing feature additions across various applications utilizing **Java**, **JSF**, and **React.js**.
 - Conducted **JMeter** performance test scripts in a Docker-Kubernetes environment, seeing CPU and memory metrics improve by **25%**.
 - Automated performance test data collection using **Python**, reducing manual effort and reducing time between tests by **34%**.
- Process Improvement and Design Engineer, Metalumen Manufacturing Inc.** 05/2023 – 08/2023 | Guelph, ON, Canada
- Constructed an **Arduino**-based real-time part tracking system using **infrared** sensors to monitor assembly line output.
 - Overhauled manufacturing production workflows using **LEAN** manufacturing principles and mechanical designs in **SOLIDWORKS**, resulting in annual savings over **\$85 000** and **2200** working hours.
 - Spearheaded the design, scaling and deployment of an automation application using **Python** and **VBA**, resulting in a **350%** reduction in time study analysis.
- Software Engineering Intern, IMAX Corporation** 07/2021 – 08/2021 | Waterloo, ON, Canada
- Collaborated with DevOps team of ~15 members, building **command line** tools and unit tests with **Python** for use throughout the company.
 - Optimized Gitlab's **CI/CD REST API** consumers by refactoring **MySQL** schemas and query logic, resulting in improved pipeline execution.

Projects

- Ball Balancer Robot** 🌐, *OpenCV and Arduino Project* 10/2025 – 11/2025
- Engineered a 3-DOF **Stewart Platform** utilizing computer vision and **PID control** to achieve real-time stabilization of a ping-pong ball.
 - Wrote a high speed control loop bridging an **Arduino**-based servo interface with a **Python** backend running OpenCV.
 - Implemented autonomous system calibration using **AprilTags** to map camera coordinates to physical platform.
- HTTP Web Server** 🌐, *Lightweight Static Server* 11/2024 – 01/2025
- Implemented a **multi-process** HTTP server in **C**, supporting concurrent client handling and automatic zombie process reaping.
 - Utilized **POSIX APIs** for socket programming and **TCP/IP** communication to serve static files with appropriate **HTTP** responses.
- Multi-Threaded RTOS** 🌐, *STM32F401RE* 07/2024 – 08/2024
- Built a **real time microkernel** with multi-threading concurrent capabilities using **C** for ARM Cortex-M on an **STM32 Nucleo Board**.
 - Utilized a hybrid **CPU scheduler** combining **yielding** and **time-based pre-emptive** context switching, optimizing task prioritization and CPU usage using interrupts and ISRs.
 - Designed a custom **memory allocator** for thread initialization, managing stack allocation and context storage in thread control blocks.

Education

- BASc, Mechatronics Engineering, University of Waterloo** 09/2022 – 05/2027 | Waterloo, Ontario
- Paul Craven Engineering and Athletics Excellence Award 🌐, RWDI Engineering and Athletics Excellence Award 🌐, Amar Varma Volleyball Award 🌐, Beattie Alumni Volleyball Award 🌐, Ken Davies Memorial Award 🌐, President's Scholarship of Distinction.
 - Demonstrated leadership as **captain** on the **Varsity Men's Volleyball Team** while training **25+ hours** a week.
 - 4.0 GPA (91.6%)**, 4x Academic All Canadian, 2024 Dean's Honour List.
 - Coursework: DS&A, Computer Architecture, Embedded Systems, Operating Systems, Circuit Design, Robotics, Dynamics, Controls, ML