MAX HALANEN

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TECHNICAL SKILLS

Languages: C/C++, Python, ARM assembly, x86 assembly, Java, Powershell, Bash, Verilog

Tools: Git, gdb, QEMU, Valgrind, FreeRTOS, Docker, KiCad, Linux, Doxygen, Jira (Agile)

Networking: Wireshark, Light weight IP (LwIP), TCP/IP, ESXi, vSphere, PuTTY

Embedded & Hardware: ARM TrustZone, STM32, ESP32, Oscilloscope, Logic Analyzer

EXPERIENCE

General Dynamics (GDMS-C) Sep 2025 - Present

Embedded Software Developer - Internship *Ottawa, ON*

- Engineered secure embedded software stack, leveraging STM32H5 Cortex-M33 TrustZone, enabling signed firmware flashing and over-the-air (OTA) update capabilities
- Developed Cortex Microcontroller Software Interface Standard (CMSIS) compliant drivers, allowing for standardized hardware abstraction and reducing future development cycles by $\sim$**90%**

General Dynamics (GDMS-C) Sep 2024 - Aug 2025

Systems Engineer - Internship *Ottawa, ON*

- **Saved the company $50000+** in projected salary costs by developing router automation app that outperformed a competing in-development solution
- Spearheaded development of a RAG LLM automating document search, secured **$15000** in project funding, and earned praise from the Chief Engineer and senior leadership
- Created cross-network remote installer deploying software across **100+ machines** using PowerShell and WinRM
- Worked on a custom Wireshark packet dissector for proprietary protocols, opening up new capabilities for debugging and automation

Geek Education Sep 2021 - Dec 2021

Programming Instructor *Remote*

- Mentored **over 20 students** in Python and Scratch, helping them reach personal learning goals and gain admission to competitive programs at Waterloo University
- Instructed a diverse age group, ranging from 6 to 14, adapting teaching methods to cater to varying learning styles and needs

PROJECTS

Handheld GPS device | *C/C++, ESP32, GPS* May 2025 - Jun 2025

- Developed a handheld GPS navigation device using an ESP32 to display maps in real time based on user location. Loaded maps from SD card to TFT LCD over SPI, integrated a magnetometer via I2C

STM32 IoT Thermostat System | *C/C++, STM32, LwIP, FreeRTOS* Jul 2025 - Aug 2025

- Built an IoT thermostat on STM32 with FreeRTOS + Lightweight IP (LwIP) with BMP180 sensor, achieving **99%** idle task uptime (efficient CPU utilization) while maintaining **less than 1ms** sensor polling latency
- Implemented UDP server with LwIP to transmit BMP180 sensor data to home lab HTTP server, enabling reliable real-time monitoring and secure global access via end-to-end encrypted VPN

EDUCATION

Carleton University Graduating: **May 2027** | GPA: 3.84 / 4.0

Bachelor of Computer Science Honors *Ottawa, ON*

Relevant Courses: Discrete Structures II (A+), Database Management Systems (A+), Introduction to Systems Programming (A), Applied Cryptography and Authentication (A+)