# Gavin Guinn

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## Profile

Embedded Software Engineer with over 3 years of experience developing production-grade C/C++ software for microcontrollers and Linux environments. Demonstrated success in leading teams, mentoring interns, and managing complex firmware projects from design to deployment. In my spare time I enjoy skiing in the Rocky Mountains and experimenting with generative AI.

## Education

### Bachelor of Science in Computer Science – University of Calgary

May 2018 - May 2022

President of the Computer Science Undergraduate Society, NSERC Undergraduate Student Research Award.
**GPA:** 3.49/4.00

## Work Experience

### Firmware Engineer – Simply Embedded

Jan 2021 - May 2024

- **Firmware Development:** Engineered robust RTOS C/C++ firmware solutions on 32-bit ARM microcontrollers, ensuring high reliability though unit-testing. Utilized Linux as a development environment and maintained version control with Git.
- **Technical Leadership:** Led the interview and selection process for five engineering interns, providing hands-on training in firmware development and debugging to ensure they quickly became productive team members.
- **Device Drivers**: Developed and maintained drivers for peripherals (DAC, ADC, modem, ect.) within a FreeRTOS environment, managing multi-threaded operation. Employed logic analyzers to debug digital signal protocols (UART, SPI, I2C).
- **Network Protocol Integration**: Utilized TCP/IP, UDP, and DNS to ensure stable and secure data transmission in IoT applications over CAT-M LTE networks. Developed robust error handling to maximize reliability in variable network conditions.
- **Python Development:** Forked a substantial open-source Python project, using OOP design principles to customize the tool for internal QA use. Extensively used Python to unit-test the network-based features of embedded devices.
- **Data Management:** Utilized SQL for querying and managing device telemetry data stored in Azure. Analyzed large datasets to conduct root-cause analysis and work closely with the QA team to document issues and implement solutions.
- **GUI Design:** Led the development of user interfaces for multiple embedded projects, developing resource constrained GUI's using LVGL. Worked iteratively with clients to refine device HMI, ensuring our products are accessible.
- **Client Engagement:** Excelled in client interactions, from cold conversations at tradeshows (CES 23/24) to in-depth meetings during international trips. Experienced in converting customer business needs to concrete development objectives.

### Research in Theoretical Computer Science – NSERC Research Award

Sept 2021 - Apr 2022

- **Mathematical Research:** Studied computational number theory under Dr. Michael J. Jacobson, using algorithms and computational methods to explore Aliquot sequences, contributing to the understanding of their statistical properties.
- **High-Performance Compute:** Developed scalable and parallel algorithms in C and OpenMP, effectively leveraging an 800GB RAM, 80-thread research cluster to optimize the computation of Aliquot sequences.
- **Comprehensive Documentation:** Produced a thorough undergraduate thesis and Doxygen-generated code documentation, providing a clear foundation for future research on Aliquot sequences.

| | **Skills** | **Tools / Libraries** |
|---|---|---|
| *Firmware* | C, C++, ARMv8 Assembly, Makefile, CMake | JLink, GDB, STM32Cube, MCUXpresso |
| *Networking* | TCP/IP, UDP, DNS, MQTT, SSL | Wireshark, Azure, QEMU |
| *Software* | Python, Bash, Java, Web development | Git, Jenkins, GitHub, Windows, Linux |

### Retail Sales Staff – Camper's Village

May 2014 - July 2021

- **High Service Sales:** Engaged with customers to understand their requirements and recommend the best camping products.

## Other Experience

### President – Computer Science Undergraduate Society

Sept 2020 - Feb 2021

- **Organized CalgaryHacks 2021:** Led a 20-member volunteer team, bringing together over 700 participants and distributing $15,000 in prizes, fostering growth in Calgary's tech community.
- **Stakeholder Communication:** Managed sales, from package development to payments, with outside sponsors. Facilitated regular meetings with the Computer Science Department to report on club activities.