Guhan Iyer

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Technical Skills

Languages: C, C++, Assembly (ARM, RISC-V), Python, Rust, Java, Bash
Libraries & Tools: Valgrind, GDB, CMake, Make, Android Tools (adb, Fastboot), Docker
Technologies & Protocols: Linux, QNX, FreeRTOS, CAN, TCP/IP, UART, I2C, gRPC, protobuf

Professional Experience

Nokia Sept. 2025 – Dec. 2025
Firmware Engineering Intern *Ottawa, Ontario*

- Built a **C++17** abstraction layer to translate encoded chip configurations into typed structs for SDK development, reducing initialization and boot latency across **20+** operating modes for **50+ engineers**.
- Eliminated packet corruption in a critical **C++** message-passing utility by enforcing 128-bit atomic writes to structured packets, **resolving race conditions** and ensuring data integrity.
- Implemented isolated ADC/DAC initialization and configuration, enabling **targeted debugging** of individual ASIC modules for **all downstream customers**.
- Resolved **10+** major defects in the SDK by analyzing firmware trace logs, reducing daily crash frequency to **zero**.

Ford Motor Company Jan. 2025 – Apr. 2025
Software Development Intern *Waterloo, Ontario*

- Designed and implemented **Python** libraries to generate invalid ECU access tokens, enabling native security testing of a daemon deployed across **all production ECUs**.
- Integrated new libraries into automated testing pipelines, enhancing validation workflows and eliminating reliance on **external tooling**.
- Migrated **30+** legacy tests to the new libraries and integrated with existing **Python** infrastructure, standardizing security workflows for **100+ engineers**.

NCR Voyix May 2024 – Aug. 2024
Software Engineering Intern *Waterloo, Ontario*

- Integrated a **Python** query utility into a patch management system, reducing manual retrieval time by **60%** and enabling automation for **80+** daily requests.
- Instrumented a service to validate per-device network compliance data for use **organization-wide**.
- Developed a cross-platform patch verification tool serving **10,000+** devices across **10+** platforms.

Projects

wintop | *C, MSVC, Windows API*

- Developed a CLI-based **thread and process inspector** in **C** for **Windows** platforms, exposing detailed per-thread scheduling and runtime information.
- Enumerated processes and threads with **Win32 APIs**, fetching scheduling and timing metadata with low overhead.
- Designed a terminal interface to provide **real-time** diagnostic information, emulating *top* and *ps*.

osh: The Open Shell | *C, Linux*

- Created a lightweight **Linux** shell in C supporting built-in commands and external programs.
- Implemented pipelines and I/O redirection using **Linux** syscalls and **POSIX** file descriptor semantics.
- Added persistent command history using **readline** to improve interactive usability.

Education

University of Waterloo Sept. 2023 – Apr. 2028
BASc, Computer Engineering *Waterloo, Ontario*

- Relevant Coursework: Real-Time Operating Systems, Algorithms & Data Structures, Computer Architecture, Digital Hardware Systems