Guhan Iyer

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Skills

Languages: C, C++, Java, Python, VHDL, Verilog, MATLAB, Assembly
Libraries & Tools: FreeRTOS, Git, CMake, Make, Valgrind, GDB, Android Tools (ADB, Fastboot), Quartus, Apio
Technologies & Protocols: FPGA, ARM (STM32, TI), UART, SPI, I2C, TCP/IP, CAN

Work Experience

Security Software Intern Jan. 2025 – Apr. 2025
Ford Motor Company *Waterloo, ON*

- Core Operations Team

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

- Designed and maintained various internal tools for R&D teams across the company.
- Utilized **Python** to integrate an internal query utility into a newly-initiated patch management project.
- Individually developed a service to validate device compliance data for use organization-wide.
- Developed a patch verification tool to serve over **10,000** devices across **10+** device platforms.
- Refactored task-scheduled scripts to periodically update internal documents with current user information.

Student Design Teams

Firmware Developer July 2023 – Present
UW Orbital — University of Waterloo Satellite Design Team

- Created a **C**-based thermal monitoring system and essential functions for command & data handling.
- Developed an **I2C** driver in **C** to manage readings from temperature sensors and create telemetry data.
- Leveraged **FreeRTOS** to create a hysteresis event handler, effectively managing over-temperature states.
- Integrated logging and stack overflow handling in **all** interrupt services, improving system resiliency.

Projects

ChronoLogic: Internal Logic Analyzer | *FPGA, Verilog, Apio, Python*

- Built a **Verilog**-based logic analyzer for real-time signal decoding, targeting the **iCE40UP5k FPGA**.
- Developed trigged-based signal capture and buffered storage modules to enable digital logic debugging.
- Implemented a full duplex **UART** interface to capture signals for analysis and visualization.

osh: The Open Shell | *C*

- Created a rudimentary system shell in **C**, with support for various shell builtins and commands.
- Utilized ***nix system calls** to implement piping (|), redirection ($<, >$) and directory listing (ls).
- Improved responsiveness by adding a persistent command history and parallel execution with **threads**.

IKEA: Maze Solving Firefighter Robot | *Altium, BASIC*

- Designed and built a robot to solve complex mazes where it must locate and extinguish a lit candle.
- Implemented autonomous operation software in **BASIC** with sensor-based path planning algorithms.
- Calibrated the robot to perform **sub-five second** maze solves in standard competition mazes.

Education

University of Waterloo Waterloo, ON
Candidate for Bachelor of Applied Science in Computer Engineering *Sept. 2023 – Present*

- Relevant Coursework: Algorithms & Data Structures, Digital Systems, Digital Computers, Numerical Methods