Ahnaf Shahriar

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Education

University of Waterloo — Waterloo, ON
Bachelor of Applied Science in Computer Engineering — *Sept. 2021 – May 2026*

Experience

Software Engineering Intern — Sept. 2022 – Dec. 2022
Synapse Product Development — *Seattle, WA*

- Leveraged **Zephyr RTOS** to create an **NRF52 BLE Prototype.**
- Developed **Python APIs** for lab testing equipment**(Agilent, Keysight, NI, Tektronik)**
- **Automated** various testing and in house procedures using **Python and bash scripts.**
- **Designed** Docker containers for Gitlab pipelines to complete test and build jobs.

Firmware developer — Jan. 2022 – April 2022
Ford motor Company of Canada — *Remote*

- Improved **Jenkins CI/CD** pipelines to achieve **unit testing automation** using **Python** for Linux server.
- Lead developer for **Unity/Cmock Test framework** optimization for unit testing, achieving up to **30% faster** runtime while using **50%** fewer test cases.
- Tested algorithms and debugged on hardware test benches.
- Debugged Embedded C code for MISRA compliances using **Polyspace**.

Firmware Team Member — Sept. 2021 – Present
UW Midnight Sun Solar Rayce Car Team — *Waterloo, ON*

- Handled Task queueing, scheduling, and priorities using **FreeRTOS** for embedded systems training.
- Programmed **smoketesting firmware** in C for **STM32** processors in a virtual machine using Vagrant **Virtual Box**.
- Implemented **CAN framework API autogeneration**using **Python and Jinja2.**

Projects

Game Of Life | *C++, Python, OpenGL API, Git*

- Implemented all stages of the **Graphics pipeline** to achieve **2+ million polygons** rendering efficiently via triangles.
- Abstracted complex Graphics API code into simpler **game engine API** classes(Shaders, Vertex, Renderer, etc) for more practical **development and debugging.**
- Designed my own testing assert macros to debug Graphics errors in **VS Studio/Xcode Debugger**

LC VM | *C, RISC-V Assembly, Python*

- **Simulated hardware** for registers, operational codes, and Operating system trap protocols with **C dynamic memory allocation**.
- Designed **step-over assembly instruction debugger** to log errors in VM by mapping memory address and operations.
- Analyzed and compared **20+ million** lines of logs using **Python scripts** for CPU instruction optimization.
- Enhanced online solution by effectively **modeling finite machine states** to increase Virtual CPU operation speed up to **50%**

Morse Code Time Machine | *C, STM32*

- Prototyped Breadboard and debugged for communications such as **ADC, UART, and USART**.
- Handled real-time embedded system issues such as **task queueing, scheduling, and interrupts** to deliver a smooth player experience.

Technical Skills

Languages: Python, C/C++, Perl, shell scripting, ASM RISC, VHDL/Verilog
Tools: Quartus, Git, Linux, LLDB/GDB/CUDA-GDB, Docker, Jenkins, UVM, Matlab
Hardware: Oscilloscopes, Logic Analyzer, Circuit Design, TCP/IP, Ethernet, CAN, LIN,