ANDY REN

Computer Engineering at University of Waterloo

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EXPERIENCE

Software Engineering Intern (EmOS)
San Francisco, California
Cruise | September 2022 – December 2022

- Developed proof-of-concept of an ethernet-based centralized kernel logging system for embedded **Linux** devices running on **Cruise**'s self-driving vehicles, primarily in **C**
- Upstreamed patch to **Linux** kernel: Allow live renaming when an interface is up - bd039b5

Firmware Subteam Advisor
Waterloo, Canada
Waterloop | January 2022 – Present

- Developed a state machine driver in **C** for an **STM32F04**-series microcontroller to control the hyperloop pod safety indicator lights, based on CAN state messaging from various subsystems

Platform Engineering Intern
Santa Clara, California
Arista Networks | January 2022 – April 2022

- Ported hardware configuration tests for a family of network switches to be more modular in **Python**, improving test extensibility
- Designed a proprietary token generator for all network switches families at the manufacturing configuration stage

Embedded Software Intern
Waterloo, Canada
Nuvation Energy | January 2021 – April 2021

- Developed firmware in **C/C++** and hardware-in-the-loop system tests in **Python** for the Nuvation **Battery Management System**
- Drafted and implemented a prototype software model in **C++** for migrating SPI flash memory data on boot after a firmware upgrade

Software Engineering Intern
Kanata, Canada
VirtaMove | September 2019 – December 2019

- Built a robust internal test framework using **Python** and **Robot Framework**, which enabled rapid nightly release testing - reducing software verification time by **50%**
- Redesigned migration agent key generation in **C++** to save state, enabling uninterrupted host system communication with remote agents after a system reboot, enhancing product scalability

PROJECTS

RISC-V CPU
SystemVerilog | Verilog | November 2021

- 5-stage pipelined, 32-bit CPU built on the **RISC-V** ISA

ARM RTX Kernel
C | GDB | Arm Cortex M3 | August 2021

- Real-time operating system kernel for an **NXP LPC1768** microcontroller with dynamic memory allocation, console I/O and real-time task scheduling

SUMMARY

- Professional experience in firmware and operating systems development for **ARM**-based embedded systems using **C**, **C++**, and **Python**
- Experience in open-source **Linux** kernel development
- Coursework in real-time programming, FPGA/RTL programming in **Verilog**, and **RISC-V** assembly

SKILLS

Languages

C | C++ | Verilog | Python | RISC-V

Tools, Frameworks, and Libraries

Linux | Buildroot | arm-gcc | gdb | Git | Docker | Vivado | Robot Framework

EXTRACURRICULARS

Fitness Enthusiast
Avid weightlifter and distance runner

Musician
Piano and **Alto Saxophone** player

EDUCATION

BASc., (Hons) Computer Engineering
University of Waterloo
September 2018 – May 2023 (Expected)

- cGPA: 3.7/4.0 (82%)
- Relevant Courses:
  - ECE 250 - Algorithms and Data Structures
  - ECE 252 - Systems Programming and Concurrency
  - ECE 350 - Real-Time Operating Systems
  - ECE 327 - Digital Hardware Systems
  - ECE 320 - Computer Architecture
  - ECE 445 - Integrated Digital Electronics
  - ECE 451 - Compilers
  - ECE 495 - Autonomous Vehicles