

# ANDY REN

## Software Engineer

@ andy.ren@uwaterloo.ca

1-415-605-3089

andyren.me

linkedin.com/in/andy-ren

github.com/ren-andy

## EXPERIENCE

### Software Engineer - CoreOS

San Francisco, California

#### Cruise

July 2023 – Present

- Device OS bring-up for the Origin, Cruise's next-generation autonomous vehicle with no steering wheel
- Custom Linux kernel development for autonomous vehicle systems

### Software Engineering Intern - CoreOS

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

### 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

### Embedded Software Intern

Waterloo, Canada

#### Nuvation Energy

January 2021 – April 2021

- 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

### BOOTLE

C++ BLE

March 2023

- Smart device prototype that incorporates everyday carry functionality into an easy-to-carry water bottle, built as central part of capstone design project

### RISC-V Processor

SystemVerilog Verilog

November 2021

- 5-stage pipelined, 32-bit processor built on the RISC-V instruction set architecture

### 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 with open-source Linux kernel development
- Coursework in performance programming with Rust, FPGA/RTL programming in Verilog, RISC-V assembly, and machine learning

## SKILLS


### Languages

C C++ Verilog Python RISC-V  
Rust

### Tools, Frameworks, and Libraries

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

## AWARDS

-  **ECE Capstone Symposium Award**  
ECE Fourth Year Design Project (FYDP) award for designing a system to consolidate everyday carry functionality

## EDUCATION

### BASc., (Hons) Computer Engineering University of Waterloo

September 2018 – June 2023

- Graduated with Distinction
- cGPA: 3.7/4.0
- Relevant Courses:
  - ECE 350 - Real-Time Operating Systems
  - ECE 327 - Digital Hardware Systems
  - ECE 320 - Computer Architecture
  - ECE 445 - Integrated Digital Electronics
  - ECE 451 - Compilers
  - ECE 459 - Programming for Performance
  - ECE 495 - Autonomous Vehicles