

# ANDY REN

## Computer Engineering at University of Waterloo

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## EXPERIENCE

### Incoming Diagnostics/Platform Engineering Intern

Arista Networks

January 2022 – April 2022

Santa Clara, California

### Embedded Software Intern

Nuvation Energy

January 2021 – April 2021

Waterloo, Canada

- Developed firmware in **C/C++** for the Nuvation **Battery Management System**
- Drafted and implemented a prototype software model for migrating flash memory data after a firmware upgrade
- Constructed system tests and test fixtures in **C++** and **Python** to verify firmware features in simulated and hardware environments
- Debugged and investigated numerous real-time bugs and test regressions using **gcc** and **Python**, improving firmware robustness

### Software Developer

VirtaMove

September 2019 – December 2019

Kanata, Canada

- Built a robust internal test framework for VirtaMove using **Python** and **Robot Framework**, which executed release-critical manual tests nightly, reducing software testing and verification time by up to **50%**
- Implemented features in **C/C++** which enabled V-Migrate host certificate regeneration, and resolved various runtime concurrency errors
- Redesigned migration agent key generation, enabling V-Maestro to communicate with previously linked agents after a system restart, improving product scalability
- Prototyped a new product activation graphical interface for migration licensing using **C#**, **.NET Core**, and **C++**

## PROJECTS

### ARM RTX Project

2021

- Constructed a real-time operating system kernel for an **ARM Cortex M3** microcontroller in **C** for a course lab component.

### Systolic Array

2021

- Developed and deployed a matrix multiplication systolic array bitstream using **Verilog** for a Xilinx Pynq FPGA board

### home-monitor

2020

- Built a multi-threaded home monitoring embedded system using a **Raspberry Pi 3B+** and **C++** capable of detecting nearby intruder movement, reading and displaying temperature and humidity, and playing music.

## SUMMARY

- Professional experience in software/firmware development and testing with **ARM Cortex M** based embedded systems using **C**, **C++**, **Python**
- Practical experience with **Unix** programming, **RTL** programming in **Verilog**, and **RISC-V** assembly

## SKILLS

### Languages

C C++ Verilog Python JavaScript

### Tools and Frameworks

Linux gcc git STL Docker  
Vivado Robot Framework Cpputest

## EXTRACURRICULARS

 **Engineering Student Councillor**  
Advocate for engineering student interests

 **Fitness Enthusiast**  
Avid weightlifter and distance runner

 **Lifelong Musician**  
Played **Piano**, and **Alto Saxophone** for over a decade

## EDUCATION

### BASc, Computer Engineering

**University of Waterloo**

September 2018- May 2023 (Expected)

- cGPA: 3.3/4.0
- Relevant Courses:
  - ECE 250 - Algorithms and Data Structures
  - ECE 224 - Embedded Microprocessor Systems
  - ECE 252 - Systems Programming and Concurrency
  - ECE 350 - Real-Time Operating Systems
  - ECE 327 - Digital Hardware Systems
  - ECE 320 - Computer Architecture