

ANDY REN

Computer Engineering at University of Waterloo

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EXPERIENCE

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
- Configured the V-Migrate installer to automatically resolve TCP/IP port collisions, and perform closed network installation using **WiX Toolset**
- 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

May-Aug 2021

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

Systolic Array

May-Aug 2021

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

home-monitor

github.com/ren-andy/home-monitor

- 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
Vim Vado 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