

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 model for migrating flash memory data after a firmware upgrade
- Wrote and refactored unit and system tests in **C++** and **Python** to test various firmware features in simulated and hardware environments
- Debugged and investigated numerous real-time firmware bugs and test regressions using **gdb** and **Python**, improving system 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++**

Web Analyst

Agriculture and Agri-Food Canada (AAFC)

January 2019 – April 2019

Ottawa, Canada

- Developed responsive web interfaces using **JavaScript**, **HTML** and **CSS** for intra-departmental clients on the AAFC **SharePoint** platform
- Rewrote web scraping scripts in **PowerShell** using the **SharePoint API** to improve parsing functionality for remote endpoint tabulation of departmental **SharePoint** usage statistics

PROJECTS

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, **RISC-V** assembly, and **JavaScript** backend development

SKILLS

Languages

C++ C C# Python MATLAB
JavaScript RISC-V Bash

Tools and Frameworks

Linux gcc gdb Git Docker
Robot Framework Pyunit Cpputest

EXTRACURRICULARS



Engineering Councilor

Advocate for the academic interests of engineering faculty students



Fitness Enthusiast

Avid weightlifter and distance runner



Lifelong Musician

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

EDUCATION

Candidate for BAsC, Computer Engineering

University of Waterloo

September 2018- Present

- 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