ANDY REN

Computer Engineering at University of Waterloo

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EXPERIENCE

Embedded Software Intern (Remote)
Nuvation Energy

📅 January 2021 – April 2021   📍 Canada

- Developed firmware in **C/C++** for the Nuvation **Battery Management System**
- Drafted and implemented a prototype model for migrating SPI 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 Councillor**
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