Andrew R. Rooney

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Education

University of Alberta — ***Computer Engineering, Nanoscale System Design (Co-op), B.Sc.***
Edmonton, AB — GPA: 4.0/4.0 | Sept 2017 - June 2022 (expected)

Key Skills and Experience

- **Relevant courses include**: Advanced Digital Logic Design, Object Oriented Software Design, IC Design, Computer Organization and Architecture, Nanoscale Devices, File and Database Management, Microprocessors and Embedded Software Design
- **Experienced with**: C/C++ (especially for embedded systems), Linux, real time operating systems, VHDL, Cadence Virtuoso/Encounter, Xilinx Vivado, Intel SoC EDS, Java, JavaScript, Python, TCL, Bash, SQL, Angular, React, D3, Git, Jenkins, and TravisCI. Quick and eager to grow my technical skills.

Work and Volunteer Experience

Mission Control Space Services Inc.
Ottawa, ON

Software/Robotics Engineer, Co-op — ***May 2021 - Dec 2021***

- Major contributor to the design and implementation of embedded communications software for the Emirates Lunar Mission's "Rashid" rover (expected launch in 2022)
- Worked closely with customers to refine product requirements and wrote hundreds of automated tests to demonstrate/verify requirements
- Took part in planning sprint tasks every 2 weeks to ensure software releases were shipped on time

Intuit
Edmonton, AB

Software Developer, Co-op — ***Jan 2020 - Aug 2020***

- Created an internal data visualization tool to collect and display historic data for different plugins on the Quickbooks platform by using React & D3 to provide thousands of developers insights about code usage and performance
- Key member of a small team which refactored the Quickbooks plugin hosting system (100k+ line of code repository) to adapt to the new company standard to increase long-term maintainability
- Improved development operations by migrating 5 regression testing suites from CircleCI to Jenkins and integrated the build system with Github to consolidate testing systems

Nokia
Ottawa, ON

Service Router Testing, Co-op — ***May 2019 - Aug 2019***

- Investigated, diagnosed, and fixed test failures that occurred during the extensive TCL-based regression testing suites running on the service routers
- Developed a full stack tool to automatically calculate and store pass/fail criteria for all tests to improve maintainability of test vectors, which commonly included over 100K input/output pairs per test suite
- Designed a Redis and MySQL caching solution to support loading millions of test outputs in less than 5 seconds into the above-noted test interface, which was prohibitively slow beforehand

AlbertaSat
Edmonton, AB

Ex-Alta 2 Software Team Lead ***Sep 2018 - Present***

- Volunteer to manage a team of about 6 peers to develop open source embedded software on an ARM Cortex microcontroller in C with FreeRTOS
- Regularly compile and present formal design documents and progress reports to faculty advisors, and the Canadian Space Agency to convey flight-readiness of designs
- Designed a service-oriented architecture for commanding the Ex-Alta 2 satellite using the TCP/IP-like 'Cubesat Space Protocol' network stack over various hardware protocols (CAN, I2C, UART)
- Contributed to hardware/software designs used on the payload SoC (Intel Cyclone V)

MIIST Software Team Lead ***Jan 2018 - Aug 2018***

- Created data collection software for the Multispectral Imaging In-Situ Test High Altitude Balloon Mission to verify the Ex-Alta 2 optical structure in the stratosphere
- Spent 3 weeks in Timmins, ON at the Canadian Space Agency's Stratospheric Balloon Base integrating our imaging payload onto the gondola which took the experiment into the stratosphere

Dept. of Electrical and Computer Engineering
Edmonton, AB

Undergraduate Student Researcher (NSERC USRA) ***May 2018 - Aug 2018***

- Conducted research to develop the I2C drivers for the Ex-Alta 2 satellite, and integrate them with the transport layer of the network stack
- Created ground station automation software for the Ex-alta 1 satellite using Bash, and FORTH, scripts along with C code to make daily orbital operations more convenient

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Awards and Certifications

- 1st Place, Intuit HackED Beta Hackathon (2019)
- 2nd place, UAlberta Team Programming Contest (2019)
- 2018 NSERC Undergraduate Student Research Award (ECE Department)
- 2018 University of Alberta Undergraduate Academic Scholarship
- 2017 Faculty of Engineering Academic Excellence Scholarship
- Level 1, Project Management Principles & Practices
- Level 3, HSK (汉语水平考试) Chinese proficiency
- Basic with Honours HAM radio license (callsign VA6-OOF)

Projects

- 11-instruction, 8-bit CPU on Xilinx FPGA

Designed, implemented, and verified a CPU in VHDL using simple datapath/FSM architecture. Capable of addition, subtraction, shifting, and conditional instructions

- 6x6 Digital Multiplier VLSI Design Project

VHDL multiplier design was simulated & optimized using Cadence Encounter, and hold times were verified. Design was then routed & extracted in Virtuoso where the multiplier then passed all LVS and DRC checks

- *Squabble.xyz multiplayer game* (github.com/arrooney/squabble.xyz)
- *AlbertaSat Embedded Software and Ground Station* (github.com/AlbertaSat)

References Available Upon Request