Melissa Martin

Education

Bachelor of Science, Computer Engineering, *University of Manitoba*
Graduated May 2023 with Distinction

Capstone Project: The Design and Implementation of an Autonomous Tennis Ball Collecting Robot *(IEEE Winnipeg Section 1st Place)*

- Completed embedded systems design of robot, including construction of robot chassis, configuration of drivetrain electronics, interfacing with the motor controller to move the robot and the motor encoders to read diagnostic data.
- Performed integration of autonomous, embedded systems, and UI modules of the robot project using ROS and Docker.

Engineering Experience

Computer Engineer-In-Training **May 2023 — Present**
Manitoba Hydro *Winnipeg, MB*

- Used Python and Bash to integrate stochastic water modelling software with established perfect foreknowledge water modelling system to improve the reliability of the hydroelectric utility's water management operations. Initial results indicate this project will increase corporate revenue by up to $50 million over the span of 3 years.
- Reduced annual licensing expenses by $16 thousand through replacement of C proprietary library functions with open source library functions. Implemented efficient multithreading techniques to maintain low run times, ensuring cost savings without sacrificing performance.
- Utilized data analysis and predictive modeling to determine the essential operational requirements necessary to meet peak yearly energy load demands for the next 5 years, considering both typical operating conditions and extreme edge cases to ensure system reliability in challenging conditions.

Teaching Assistant - Digital Logic **Sep 2022 — Dec 2022**
University of Manitoba *Winnipeg, MB*

- Provided guidance and lab instruction to students on the fundamental concepts of computer logic, the operation of the Terasic DE10-Standard Development Board and Verilog programming.
- Evaluated students' understanding of course materials through grading lab reports and course assignments, and reviewing design project reports and presentations.

Intelligent Network and Distributed Energy Resource Connections Engineering Aid **May 2021 - Aug 2021, May 2022 - Sep 2022**
Manitoba Hydro *Winnipeg, MB*

- Developed a Python desktop application for automated aggregation of data received from power quality monitoring devices to reduce time spent on data analysis.
- Conducted a power quality investigation, using Python for data analysis, on power variation caused by cloud cover over photovoltaic panels for distributed energy resource interconnections modelling improvements.
- Programmed and configured settings for multiple remote automation devices used for power outage visibility, automatic load transfer and other system reliability applications using C language.

Polar Bear Racing Electric Software Systems Member **Oct 2020 — May 2022**
University of Manitoba Student Chapter of SAE International (UMSAE) *Winnipeg, MB*

- Programmed STM32 microcontrollers using C, applying FreeRTOS, CAN, SPI, and UART protocols.
- Developed SPI to CAN communication protocol interface to increase communication bus capacity and enable large future improvements to the electric racecar design, such as dual motor control and all wheel drive.
- Tested and troubleshooted racecar ACU functionality on test bench.

Electrical Engineering Aid **Aug 2020 — Apr 2021**
KGS Group Consulting Engineers *Winnipeg, MB*

- Programmed automated engineering documentation processes using Windows PowerShell.
- Optimized reporting templates using SQL and VBA to ensure timely deliverables for clients.
- Assisted hydroelectric engineers with project tracking documentation, drawing mark-ups and acquiring product information from suppliers.

Skills

Programming Languages	Proficient: Python, C Prior Experience: Bash, Java, JavaScript, HTML5, CSS
Operating Systems	Windows, Linux