Ryan Lee

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Highlights of Qualifications

- Skilled in Inventor/SolidWorks CAD, 3D printing, electrical measurement, and software automation for integrated mechatronics
- Proficient in C, C++, MATLAB, Python, Perl, Verilog HDL, P4, Git, and SQL, as well as operating in Linux/Unix environments

Projects

Haptic Glove Controlled Robotic Arm
- Designed a prosthetic robotic arm replicating glove movements using wireless radio communication
- Integrated results of analog potentiometer and sensor readings to PWM signals used in controlling servo motors for actuation
- Modelled and prototyped using CAD, incorporated using fasteners, bearings, pulleys, and mechanical tolerances

Mars 2020 Perseverance Rover Model
- Programmed DC and servo motors, controllers, and camera for real time radio communication and traversal of rough terrain
- Utilized CAD, band saw, and drill press for manufacturing and assembly of aluminum profile based chassis
- Fabricated a scaled rover replica utilizing Rocker suspension with Ackerman steering geometry

Automated Equatorial Mount for Astrophotography
- Conceptualized and built EQ mount for camera tracking of stars in night sky using stepper motor and 8:1 pulley gear ratio

Platform Ball Balancing PID
- Implemented a PID controller for 2-DOF ball balancer using resistive touch screen for input and L298N motor drive for control
- Tuned and researched PID parameters through iterative testing with signal processing filters to achieve precise ball stability

Sequential Logic Digital Design Project
- Developed a finite state machine to display digits in sequence using logic gates, flip flops, clocks, and 7 segment display
- Employed NI Multisim to efficiently design, create, test, and visualize the circuit data using built-in timing diagrams

STM32 Microcontroller Projects
- Created a fan controller where thermometer triggered fan at high temperatures using A/D conversion, OpAmps, and filters
- Investigated I2C serial communication protocol using external EEPROM chip and real-time clock to store data

FPGA Processor Design
- Created a processor using FPGA board to emulate motor controller through Verilog and ARM Assembly ASIP instruction set

Work Experience

Graphics Memory Hub Testing and Verification Engineering Intern   **May 2023 – July 2024**
Advanced Micro Devices Inc. (AMD), Markham ON
- Managed 70+ regressions for 6+ IP teams through triaging test results, achieving 99%+ coverage on several register designs
- Improved efficiency of regression verification process by 50% through scripting data displays, coverage reports, and run logs
- Collaborated with teams to analyze timing diagrams, verify RTL design, and write Verilog HDL to adhere to design verification

Education

Bachelor of Mechatronics Engineering, Co-op   **September 2020 – April 2025**
McMaster University   **GPA: 3.71**
- Studying to develop a strong understanding of high-level robotics courses including Control Theory, Data Structures and Algorithms, Embedded Systems, Robotics, Object-Oriented Programming, Signal Processing, and Predictive Controls

Leadership Activities

McMaster Baja Racing Team   **September 2022 - Present**
- Manufactured and assembled off road racing vehicles with a focus on data acquisition, incorporating electronics into design
- Monitored mechanical properties using a fleet of sensors, including Hall effect latching sensors for CVT and wheel RPM, a GPS module for tracking, magnetic field strength sensors for suspension angle travel, and brake pressure sensors for controls
- Optimized driver steering capabilities by 20% through acquiring column torque data with strain gauges and design feedback
- Programmed and tuned engine dynamometer to provide detailed reports of horsepower and torque at various RPMs

McMaster Rocketry Team   **September 2020 – May 2022**
- Worked with the ground controls to develop a functional team website for data visualization and calculations
- Leveraged LoRa and Arduino devices to develop a versatile transceiver and receiver system for telemetry over 3 kilometers