

Jerry Lu

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Summary of Qualifications

- 2 years as a propulsion project lead on the Waterloo Rocketry student design team, with strong practical experience in fluid systems as well as launch vehicle development cycle.
- 3 years of experience with design and simulation in SolidWorks, as well as 250+ hours spent in the student machine shop manufacturing and testing various launch vehicle components.
- Passion for rocketry and desire to elevate Canada's role in the space industry.

Experiences

Propulsion Project Lead, Waterloo Rocketry (Jan. 2021 – Present)

- Led the development of the team hybrid rocket's high pressure oxidizer venting system, along with a custom vent valve for controlled venting of the oxidizer tank, over two competition cycles.
- Machined and integrated four aluminum airframe couplers to join critical sections of the launch vehicle.
- Participated in numerous engine static fires, wet dress rehearsals, launch procedure rehearsals, and countless other late-night tests to successfully launch the 2023 hybrid rocket to an apogee of 31476 ft.

Scientific Support Intern, SNOLAB (Sep. 2022 – Dec. 2022)

- Designed, built, and tested high vacuum scientific instrumentation systems for Radon-222 assays.
- Constructed experimental setup to extensively test and characterize a new mechanism (using activated charcoal) for extracting Radon-222 atoms from experiment volumes.
- Improved existing DAQ software in C for recording radioactivity measured by photomultiplier tubes.
- Adherence to cleanliness and safety protocols in level 2000 cleanroom spaces while 2km underground.

R&D Engineering Intern, VN Instruments (Jan. 2022 – Apr. 2022)

- Significantly improved and automated a bead-shooting testbed for characterizing and testing saltation sensors that will be aboard potential NASA missions on Earth, Mars, and Titan.
- Completed rapid prototyping of 10+ parts using SolidWorks and MarkForged 3D printer.
- Constructed a custom wind tunnel for characterizing saltation sensor outputs in uniform wind fields.
- Programmed various Python interfaces for efficient, fail-safe, real-time control of motorized systems.
- Designed (via KiCAD) and soldered simple MOSFET switching PCBs for laser and motor control.

Technical Skills

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|--------------------------|------------------------|--------------------|
| • Machining (250+ hours) | • MATLAB (2 years) | • Python (3 years) |
| • SolidWorks (3 years) | • ANSYS (Introductory) | • C/C++ (1 year) |

Projects

Spin Stabilization System for Hoisted Payloads (SpinStop), Team Project (August 2023 – Present)

- Engineering Capstone project developing a system to control the unintentional spin of cable-hoisted payloads, currently targeted towards rescue subjects being hoisted by Search & Rescue helicopters.
- Currently specializing in controls scheme design, exploration of system design space via MATLAB, mechanical design via SolidWorks, and prototype development.

Autonomous Mobile Robot Software Stack, Course Project (September – November 2023)

- Implemented a comprehensive software stack in Python and ROS2 to enable autonomous navigation of mapped areas by two-wheeled robots. Simulations done in Gazebo before testing on hardware.
- Stack includes PID controller, EKF state estimation, and RRT* path finding algorithm.

Autonomous Wall-Climbing Vehicle (Wall-e), Team Project (January – March 2023)

- Built a magnetically tracked vehicle capable of autonomously (with a teeny bit of human help) climbing over a steel wall and locating a target on the other side.
- Specialized in the study of overall system physics, vehicle chassis and drive train design.

Education

- Candidate for BAsC Mechatronics Engineering, University of Waterloo, 2024.