

SKILLS

Programming	C++, Python, Rust, MATLAB, ROS, Git, Docker, SQL, VBA, Bash scripting
Software	Linux, ETX , SolidWorks, NX, Visio, AutoCAD
Hardware	Design of high pressure systems, cryogenics, data acquisition, launch vehicle architecture & design
Communication	English, French

EDUCATION

B.Eng. Chemical Engineering

McGill University

2015—2019

Montreal, Quebec

EXPERIENCE

FLIGHT SYSTEMS LEAD & PROPULSION ENGINEER

SpaceRyde

Sep 2019 — Apr 2022

Toronto, Ontario

- Led a small interdisciplinary team to design the main internal flight systems for an orbital flight vehicle, including pressurization systems, data acquisition systems, engine control units, and ground support equipment. Scope of responsibilities included requirements generation, project planning, conceptual design, component sourcing, design reviews and interfacing with other stakeholders.
- Designed, built and commissioned test facility for a 50 kN paraffin-LOX hybrid rocket engine, the largest of its kind ever built in Canada. Responsible for beginning-to-end scope of work including initial determination of requirements, conceptual design, detailed design of plumbing, electrical, instrumentation, and electronic systems, sourcing & vendor management, and installation & commissioning. Ensured facility conformed to appropriate design standards, such as ASME BPVC Section VII Div. 1, ASME B31.3, NSS 1740.15, UL 508A, etc.
- Developed and implemented safety, testing and maintenance procedures for the facility, with 0 safety incidents since commencement of operations. Trained all test personnel on test site safety & best practices.
- Coordinated and supported hybrid engine testing campaign by organizing and scheduling maintenance and tests. Acted as main test director for nearly all hot fire tests, which were all safely completed on schedule.
- Architected and wrote software for ground test and flight systems, in Python and C++. Individual contribution was approximately 15,000-25,000 lines of code.
- Developed various models and analyses in Python and Excel to support concept generation and validation of launch vehicle architectures, balancing technical feasibility, cost, and schedule risk.

TEAM CO-CAPTAIN & PROPULSION LEAD

McGill Rocket Team

Sep 2016 — Aug 2019

Montreal, Quebec

- Led a team of over 150 members and 15 technical leads to design, build, test and launch sounding rockets. Oversaw system-level design and manufacturing of a supersonic solid rocket for the 2019 Spaceport America Cup, placing 4th in the 30,000 ft commercial-off-the-shelf (COTS) category.
- Core member and propulsion lead of the McGill team in the 2018 Spaceport America Cup, which placed 1st overall among 150+ international teams, and 1st in the 10,000 ft COTS category. Contributed to the design, manufacturing, and final integration of the rocket.
- Spearheaded a plan for a 5.0 kN hybrid and liquid engine test facility. Scope of work included conceptual design, budget, funding plan, timeline, safety and quantity-distance analysis. Negotiated with key stakeholders to secure a plot of land on university grounds for engine testing, and secured funding for initial construction of facility.
- Managed an annual budget of \$60,000 with an additional \$80,000 in material sponsorship. Key liaison between sponsors and team.
- Developed and implemented comprehensive team-wide safety practices, including mandatory training sessions, FMEA analysis, SOPs, and chemical inventory audits.
- Designed and built a basic test stand for a 1.5 kN paraffin-nitrous hybrid rocket engine. Engine was successfully test fired in spring of 2018.

SCIENTIFIC PROGRAMMER

Juncker Lab

May 2019 — Aug 2019

Montreal, Quebec

- Improved and refactored a MATLAB image processing pipeline for quantum dot superresolution microscopy. The project was largely undocumented, spanning hundreds of files and over 10,000 lines of code.
- Refactored existing code to use more efficient algorithms, improving accuracy and reducing processing time by 50%.

RESEARCH ASSISTANT*Electrochemistry/Corrosion Lab***May 2017 — Dec 2017***Montreal, Quebec*

- Performed electrochemical experiments to characterize and refine the performance and stability of metal oxide catalysts for water splitting (green hydrogen production). Techniques employed include Tafel polarization, chronoamperometry, electrochemical impedance spectroscopy and scanning electron microscope imaging.
- Conducted literature review on the hydrogen evolution reaction with metal oxides, and contributed to drafts of research paper.
- Coauthor of paper published in *Electrochimica Acta*: *The influence of addition of iridium-oxide to nickel-molybdenum-oxide cathodes on the electrocatalytic activity towards hydrogen evolution in acidic medium and on the cathode deactivation resistance.*

RESEARCH ASSISTANT & INDEPENDENT RESEARCHER*Center for Structural and Functional Genomics***May 2014 — May 2015***Montreal, Quebec*

- Purified crude enzyme extracts from fungal cultures using fast protein liquid chromatography (FPLC).
- Predicted enzyme characteristics using homology modelling and sequence alignments (BlastP, BlastN, etc).
- Characterized the activity of glycoside hydrolases for biofuel production.
- Isolated and characterized fungal deacetylases for enzymatic chitosan production.