

Garret Langlois

519-215-6002 | langloig@mcmaster.ca | linkedin.com/in/garret-langlois

EDUCATION

McMaster University

Hamilton, Ontario

Bachelor of Mechatronics and Biomedical Engineering | GPA: 3.86/4.0

April 2028

- **Relevant Coursework:** Electromagnetism and Waves, Computational Mechanics, Analog and Digital Circuits, Digital Sequences, Signals and Systems, Coding in C, Thermal Systems Design, Space Systems Engineering
- **Awards/Honors:** McMaster Award of Excellence, Dean's Honour List

WORK EXPERIENCE

Hydrogen Optimized

Owen Sound, Ontario

Electrolysis Cell Design Internship

May 2024 to August 2024

- Enhanced hydrogen cell design through advanced finite element simulations using multiphysics software (COMSOL). Conducted research and simulations of nonlinear and hyperelastic materials to ensure optimal convergence of complex models. Identified key issues in cell design and worked to have them fixed.
- Wrote optimization scripts using python to iterate simulations using curve fitting and gradient descent to improve cell design through identification of weak points in structures and improved cell efficiency.
- Collaborated with manufacturers and engineers in a team environment to refine electrolysis cell designs, addressing issues such as leakage prevention and performance enhancement.

McMaster University

Hamilton, Ontario

Engineering Physics Teaching Assistant, Computational Dynamics

September 2024 to December 2024

- Helped students understand complex topics in the field of dynamics through the use of software to model concepts such as vibrations, translational motion, and Lagrangian Mechanics.
- Marked question bank assignments and final exams written by students, ensuring accuracy and fairness across submissions.
- Taught students to apply MAPLE and FlexPDE to evaluate problems in the field of computational dynamics.

McMaster University

Hamilton, Ontario

Engineering Physics Teaching Assistant, Electromagnetism

January 2025 to April 2025

- Selected as one of only two undergraduate TAs for the course.
- Led tutorials and provided academic support on topics including Maxwell's Equations, Vector Calculus, and Gauss's Law.
- Evaluated student performance through midterm and final exam grading.

Kinectrics (Division of BWX Technologies)

Toronto, Ontario

Electrical Engineering Internship

May 2025 to August 2026

- Consulted on power generation infrastructure for Ontario's nuclear facilities (Bruce Power, Darlington, Pickering), including a role as the lead electrical designer for a \$20 million portfolio.
- Conducted short-circuit, load-flow, and protection coordination studies using ETAP (Electrical Transient Analyzer Program).
- Performed detailed electrical analyses to provide key backing for the feasibility of increasing reactor power.
- Helped to organize monthly meetings to coordinate projects between Kinectrics & Bruce Power.

LEADERSHIP EXPERIENCE & ACTIVITIES

McMaster Interdisciplinary Satellite Team

Hamilton, Ontario

Mission Operations Team Lead & Flight Software Developer

September 2023 to Present

- Lead a team of 6 students to develop front end and back end architecture using Next.js, React, and SSR procedures for mission launch and operation for the McMaster Interdisciplinary Satellite Team.
- Wrote embedded flight software code in C for a STM32 based on-board computer using FreeRTOS.
- Helped develop software infrastructure for controlling UHF/VHF satellite TT&C uplink and downlink.

- Led team member onboarding and gave presentations to members of the CSA on mission progress.
- Designed software through proper unit testing and standardized practices which was approved by the Canadian Space Agency. This includes proper secure data handling and role based authentication for TCP/IP connections and TLS websocket connections to move data from AX25 packets to MongoDB and InfluxDB and then to Grafana and custom front end visualizations.
- Designed and implemented a command scheduler using Tailwind CSS, HTML to schedule tasks for satellite completion, authenticated with KeyCloak OAuth2.

Space Generation Congress Delegate

Sydney, Australia

Delegate

September 2025

- Selected to represent Canada at the Space Generation Congress, hosted by the Space Generation Advisory Council in support of the United Nations.
- Engaged with global space industry leaders, researchers, and fellow delegates to discuss the future of space exploration, sustainability, and international collaboration.
- Contributed to interdisciplinary workshops focused on advancing space policy, technology, and innovation for next-generation space missions.

Space Generation Fusion Forum Delegate

Colorado Springs, USA

Delegate

April 2026

- Selected to represent Canada at the Space Generation Fusion Forum, hosted by the Space Generation Advisory Council in support of the United Nations.
- Attended and participated in workshops through the forum and the corresponding Space Symposium.

High Altitude Student Platform

Ontario, Canada & Texas, USA

Electrical Subsystem Design

January 2026 to November 2026

- Help to co-engineer the power delivery module for a scientific payload to be flown on the NASA/LSU HASP balloon platform.
- Designed breakout shield using Altium, utilized soldering to adjust converter outputs.
- Developed Ground Station Control software to interface with the ISS-NEUDOSE and PRESET mission payloads.

PROJECTS

NASA SpaceApps 2025

Toronto, Ontario

Space Mobility

October 2025

- Solo-developed SpaceMobility, a 3D visualization tool for designing next-generation space habitats using NASA open-source data and human factors research, which received a second-place award locally.
- Enabled users to build and analyze space station layouts, simulate crew activity routes, and assess the efficiency of each path using a custom implementation of NASA's Task Load Index.
- Addressed habitat design challenges including layout optimization for critical functions such as life support, stowage, and crew mobility.

CONFERENCE PRESENTATIONS

International Astronautical Congress (IAC)

Sydney, Australia

RedHorizon - Achieved Competition 2025

September 2025

Canadian Space Conference (CSC)

Ottawa, Canada

Rapid Emergency Action and Contingency Tool (REACT)

January, 2026

International Astronautical Congress (IAC)

Antalya, Turkey

Rapid Emergency Action and Contingency Tool (REACT)

October, 2026