

Alex Forsyth

23yqk@queensu.ca | 647-986-9315 | forsyth-os.github.io/ | linkedin.com/in/alexforsyth1

Education

BASc Mechanical and Materials Engineering, Queen's University

3rd/4

- Focus on closed-loop control systems & leveraging FEA/CFD for mechatronic design.
- Relevant Coursework: Physics of Nuclear Reactors, Digital Systems Mechatronics

Experience

Undergraduate Research Assistant | MAX-Nuclear at Queens University

May 2025 – Current

- Project lead under Tier 1 research chair Dr. Mark Daymond at the Reactor Materials Testing Laboratory.

Facility Operator & Ice Technician | Town of Milton

Jul 2022 – Aug 2024

- Operated a \$150,000 Zamboni and maintained the ice rink refrigeration system.

Projects

Accelerator Target Slider (ATS) – Project Lead | MAX-Nuclear at Queens University

May 2025 – Current

- Designed and fabricated a \$10,000 multi-sample irradiation stage for CANDU reactor material research.
- Leveraged CFD modeling and ion-beam testing to design sample holders suitable for 500°C experiments.
- Implemented a LabVIEW/C++ automated control system for temperature, position, and irradiation dose.
- Facilitated 8x increase in irradiation efficiency accelerating CNL research on extending reactor lifespan.

Beam Profile Monitor (SWIPR) | MAX-Nuclear at Queens University

May – Aug 2025

- Assisted development of a scanning wire intensity reconstruction device for the 8MeV proton beam line.
- Designed the mounting mechanism that integrates the SWIPR and Faraday Cup Array (FCA) onto the ATS.
- Built and tested a LabVIEW control system for comparative reconstruction resolution testing.

Optimized Brake Pedal – Team Lead | Smith Engineering

Jan – Apr 2024

- Led a design team to develop a lighter weight brake pedal for the Queens Baja SAE Racing team.
- Reduced material with I-beam design and created stress uniformity with SolidWorks FEA static analysis.
- Outperformed the previous design by >50g while maintaining 1.5 FOS and driver ergonomics.

Continuously Variable Transmission (CVT) | BAJA SAE-Off Road Racing Team

Sept 2024 – Apr 2025

- Remodelled primary CVT using SolidWorks CAD, updated cooling fins to further increase convection.
- Increased manufacturability and researched future methods of CVT tuning using MATLAB Simulink.

Automated Chess Board | Personal

Apr 2025 - current

- Modelled and fabricated a belt driven 2D gantry to move chess pieces with an electromagnet.
- Developed path finding algorithm on C++ to achieve 0.5mm positional accuracy.
- Integrated a hall sensor array and embedded chess engine for accurate response to move detection.