

ALVIK MAHARJAN

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EXPERIENCE

Launch Canada Turbopump Project

Oct. 2025 – Present

Mechanical Design Contributor

- Collaborating with industry professionals and graduate students across Canada to research, design, and manufacture a custom turbopump for the Atlas Vernier LR-101 liquid rocket engine on a project funded by the Canadian Space Agency.
- Supporting the piping and instrumentation design of the turbopump system through development of P&ID diagrams.

Western Engineering Rocketry Team

Sept. 2025 – Present

Engine & Structures Subteam Member

- Designed in SolidWorks and 3D printed components for a composite tube winder for a next-generation hybrid rocket, reducing material usage by 27%.
- Contributing to research and preliminary design for the oxidizer fill system, including component selection and system architecture.

FAST LAB, Western University

Dec. 2025 – Apr. 2026

Electromechanical Lead

- Designed and built an open-source desktop machine to recycle plastic filament into consistent 3 mm pellets for reuse as 3D printing feedstock, as part of a 6-person engineering team in collaboration with the FAST LAB at Western University.
- Developed firmware on an RP2040 microcontroller to synchronize a NEMA 17 stepper motor for filament feed with a DC worm gear motor driving a tungsten carbide router bit cutter, achieving closed-loop pellet length control through encoder feedback.
- Passed all three system tests: normal pellet cutting at target frequency, E-stop hardware kill, and filament runout recovery; delivered the prototype under a \$100 CAD budget.

NASA HUNCH

Sept. 2024 – Apr. 2025

Build Team Lead

- Selected to join the first international NASA HUNCH chapter; led the mechanical design of a spherical lunar robot for imaging the lunar surface.
- Developed an ESP32-based spherical rolling robot prototype featuring a weight-shifting pendulum mechanism for directional control, wireless video transmission, and custom 3D-printed components.
- Advanced from the Critical Design Review (CDR) in Rochester, NY, to represent Canada at the Final Design Review (FDR) at Space Center Houston in Houston, TX.

PROJECTS

3D Printed Thermal Imaging Drone

July 2025

- Made a fully 3D-printed FPV drone using PLA for structural stiffness and LW-PLA ducted propeller guards, leveraging a ducted fan geometry to improve thrust efficiency by reducing tip vortices while maintaining low mass and impact resilience.
- Built a dual-camera system with real-time switching between RGB/thermal camera feeds using a Raspberry Pi Zero 2 W and VIFLY cam switcher, enabling applications in search & rescue, infrastructure inspection, and low-visibility navigation.

Novel Aerodynamics Research

Mar. 2024 – Mar. 2025

- Placed Silver at the 2025 Toronto Science Fair for researching camber-morphing wings using ANSYS Fluent CFD simulations and prototype testing of the FishBAC Concept, achieving a 19.7% improvement in lift-to-drag ratio.
- Awarded 1st place by the Society of Tribologists and Lubrication Engineers at the 2024 Toronto Science Fair for designing and testing a remote-controlled ground-effect vehicle, reducing energy consumption by 9% during low-altitude operation.

CERTIFICATIONS

- Pilot Certificate for Small Remotely Piloted Aircraft Systems (RPAS), Visual Line-of-Sight (VLOS)
- 3DSwymer Associate, Dassault Systèmes

SKILLS

CAD & Design: SolidWorks, Autodesk Inventor, OnShape

Manufacturing: Manual mill, lathe, MIG welding, FDM 3D printing

Simulation & Analysis: ANSYS Fluent

Programming: C++, Java, Python, MATLAB

EDUCATION

Western University

Bachelor of Engineering (BEng), Mechanical Engineering

London, ON

Expected April 2029

Victoria Park Collegiate Institute

International Baccalaureate (IB) Diploma; Ontario Secondary School Diploma (OSSD); Ontario Scholar Award

Toronto, ON

June 2025