

Akshay Kolwalkar

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EDUCATION

University of Toronto

Toronto

Bachelor of Applied Science, Mechanical Engineering + PEY/Co-op

- Relevant Coursework: SolidWorks, Differential Equations, Thermodynamics, Multivariable & Vector Calculus 3, Mechanics & Dynamics, Electrical Principles, Linear Algebra, Materials Science, Probability & Statistics
- Technical Skills: MATLAB, ROS2, Solidworks CSWA Certified, NumPy & Pandas, C++, React.js

WORK EXPERIENCE

Louisville Automation and Robotics Research Institute

Student Researcher

July 2025 - Present

- Working with Dr. Sabur Baidya to develop an autonomous driving algorithm to compete at F1Tenth's Boston VTC 2026.
- Using AutoDrive for 3D sim, SAC RL algo (PyTorch) in ROS2 RViz & gym, Nvidia Jetson NX board on car, Docker

Student Researcher

June 2025 - September 2025

- Worked with Dr. Alireza Tofangchi to implement a **Variable Stiffness Actuator** into an affordable prosthetic leg prototype
- Researched human gait biomechanics, 3D printed & tested multiple iterations, and modelled spring θ vs force in MATLAB

General Electric Appliances

Louisville, KY

Manufacturing Intern

June 2025 - July 2025

- Operated production equipment, ensuring quality & output standards were met, presented optimizations to the assembly process, assisted in the maintenance of niche factory equipment, and coordinated with area manufacturing engineers

PROJECTS

NASA Space Apps Hackathon

Toronto

Awards: Local Impact, Most Inspirational

October 2025

- Developed NEOScope, an interactive web app featuring a 3D visualization of 40 asteroids' orbital paths, a 2D simulation with effects of meteorite impact, and performance of impact mitigation strategies (laser ablation, gravity tractor, etc.)
- Calculations including asteroid orbital paths, meteoroid atmospheric entry flight dynamics, and meteorite impact effects, made using NASA projections and Euclidean Keplerian Orbital mechanics. Filtered through data for 40,000+ NEOs
- Used React & Three.js frontend, Python & Flask backend for NASA's SBDQ & Sentry APIs, numpy & pandas for data

University of Toronto Aerospace Team - Space Systems

May 2025 – Present

Attitude Determination and Control Systems

- Working on FINCH - a 3U CubeSat whose primary mission is hyperspectral crop imaging. Launch target is Q3 2028.
- Using STK 12 to visualize relevant satellite dynamics and celestial object coordinates to output an ideal flight path, including slew, camera exclusion zones & tracking algorithm, and LVLH determination
- Using NASA's SpicPy for celestial body ephemeris; Integration with Tensor Tech's ADCS 10m, numpy & pandas

Cinematographic Robotic Arm (MIE243 Mechanical Engineering Design)

Sep 2025 - Dec 2025

- Designed a 6 DOF robotic arm for prosumer independent cinematographers, surpassing industry standards. Competes with Motorized Precision's EVO. Used SolidWorks for 3D modelling, isometric drawings, and mass & material analysis.
- Calculated expected forces and loads to be experienced by design, critical to component and material determination.

Academic Blog - Research Intern

May 2025 - Sep 2025

Worked with Harvard PhD candidate to test & refine NLP workflows (research paper -> social media). Synthesis errors ↓75%.