

Declan Chan

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Education

BASc in Engineering Science

2025–Present

University of Toronto

- Dean's Honours List (all semesters)

IB Diploma Programme

2021–2025

Maple High School

- IB Score: 45/45

Technical Skills

Languages: Python, C, SQL, MATLAB, Bash

Libraries/Frameworks: PyTorch, NumPy, Matplotlib, ROS

Tools: Git, Linux, Slurm, SQLite, SolidWorks, OnShape

Experience

Software Developer

2025–Present

Robotics for Space Exploration

- Developed Python software in ROS 2 for autonomous control of a 6-DOF robotic arm.
- Implemented inverse kinematics and motion planning using MoveIt 2 and TRAC-IK.
- Designed robotic arm parts using 3D CAD and performed finite element analysis.

Space Systems Engineer

2026–Present

University of Toronto Aerospace Team

- Developed Python software for CubeSat attitude determination and control algorithm testing.
- Developed modular Python tools for attitude dynamics and flight simulation.
- Simulated magnetic environments using a Helmholtz cage and MATLAB.

Machine Learning Research Fellow

2026

Autonomous Discovery of Alloys

- Evaluated the robustness of machine learning force fields (MLFFs).
- Automated computational experiments using Python and Bash on Canada's Fir HPC cluster.
- Benchmarked MLFFs against density functional theory in collaboration with postdoctoral researchers.
- Presented findings at Undergraduate Engineering Research Day Conference.

Senior Instructor

2021–Present

Northern Karate Schools

- Yondan: Certified 4th-degree Black Belt.
- Gold medal at the Toronto International Tournament of Martial Arts Champions.
- Led group and private karate classes for 100+ students each week.

Projects

Machine Learning Force Field Attacks

2026

- Developed open-source software to generate gradient-based adversarial atomic perturbations.
- Built Python/PyTorch pipelines to process Materials Project and Li-C-O datasets.
- Performed ASE relaxation and perturbations workflows using Bash and Slurm.
- Analyzed and visualized attack performance using NumPy, and Matplotlib.

Neural Lab

2026

- Developed a configurable PyTorch image-classification pipeline supporting reproducible training.
- Designed modular training workflows supporting multiple datasets and model configurations.
- Automated experiment tracking with SQLite and SQL to compare accuracy of model configurations.

Medical RAG Platform

2026

- Built an interactive 3D web application for visualizing human disease progression.
- Implemented a retrieval-augmented generation system using PubMed data and IBM watsonx.ai.
- Integrated biomedical literature retrieval with an interactive React/Three.js frontend.