

Education

University of Waterloo Ontario, Canada
MASc in Mechanical and Mechatronics Engineering | GPA: 89.67 Sep. 2024 – Present
Advisor: Prof. Soo Jeon

The Hong Kong Polytechnic University Kowloon, Hong Kong
B.Eng. (Honors) in Mechanical Engineering Sep. 2018 – Jun. 2024
Graduated with First Class Honors (Mandatory Military service: 2021–2023)
Thesis: *A mobile robot with an active suspension system for navigation in uneven terrain*

Research & Work Experience

Mechanical Systems Control Lab, UWaterloo Ontario, Canada
Graduate Student Researcher Jan. 2025 – Present
Advisor: Prof. Soo Jeon
- Designing a semantic NBV planner using segmentation-guided voxel maps for grasping under occlusion

Robotics and Machine Intelligence Lab, HKPolyU Kowloon, Hong Kong
Advisor: Prof. David Navarro-Alarcon
Student Researcher (Undergraduate Research and Innovation Scheme) Sep. 2023 – Jun. 2024
- Developed motion planning and control strategies for the dual-arm robot Tiago++ for bimanual manipulation tasks.

Undergraduate Research Assistant Dec. 2020 – Jun. 2021
- Built a mobile robot capable of autonomous navigation over liquid and muddy terrain.
- Implemented a vision-based localization and navigation system using artificial markers.

Origami Labs (Start-up) Tsuen Wan, Hong Kong
Engineering Intern Jul. 2020 – Sep. 2020
- Integrated an accelerometer-based trigger system for automatic microphone activation.
- Applied signal processing (low-pass filtering) to reduce environmental noise in hardware prototypes.

Projects

End-to-End Visual Grasping with PPO, UWaterloo Jan. 2025 – Apr. 2025
SYDE 673 Video Processing and Analysis (Course Project)
- Developed a PPO-based grasping policy using the Barrett WAM arm in the Genesis simulator.
- Designed a visual reward function based on corner overlap, contact detection, and lift height.
- Built a multi-environment camera system for robust, parallelized vision-based training.

Adaptive Control of a 2-DOF Robotic Arm, UWaterloo Sep. 2024 – Dec. 2024
ME780 Adaptive Control (Course Project)
- Implemented a Model Reference Adaptive Control (MRAC) scheme to adaptively estimate unknown dynamics and ensure stable trajectory tracking.
- Derived Lyapunov-based adaptation laws and validated controller performance in MATLAB/Simulink.

Active Suspension for Navigating Rough Terrain, HKPolyU Sep. 2023 – Jun. 2024
Undergraduate Thesis Project
- Designed and built a mobile robot with four independently actuated vertical suspension units

using stepper motors.

- Integrated IMU feedback to detect terrain pitch and actively adjust body height for stable navigation.

Teaching Experience

ME549/MTE544 Autonomous Mobile Robotics

University of Waterloo

Teaching Assistant

Winter 2025, Fall 2025

- Assisted with lab sessions, and student support on topics including localization, mapping, and control.

Scholarships & Awards

International Master's Award of Excellence (IMAE), UWaterloo	2024 – 2025
Undergraduate Research Program Scholarship, HKPolyU	2023
Dean's Honour List, HKPolyU	2020/21, 2023/24
Full Entry Scholarship, HKPolyU	2018 – 2024

Extracurricular Activities

Volunteer (Score Tally), MME Graduate Research Symposium, UWaterloo	Nov. 2024
Peer Tutor in AMA1120 (Basic Mathematics II), HKPolyU	Jan. 2024 – May 2024
Mentor, Korean Student Association, HKPolyU	Sep. 2023 – Dec. 2023
Team leader, STEM Learning Kits for Overseas Students, HKPolyU	Jun. 2020 – Aug. 2020

Skills

Programming: Python, C++, MATLAB, Shell

Tools: PyTorch, ROS 1 & 2, OpenCV, Git, \LaTeX

Robots: Franka Panda, Barrett WAM, Tiago++, TurtleBot

Simulation: PyBullet, Genesis, Gazebo, Simulink

Hardware: IMU, RealSense L515/D455, Arduino, Jetson Orin, Raspberry Pi