

EDUCATION

M.S. in Robotics, University of Minnesota, Twin Cities	Minneapolis, MN
<i>Courses: Robot Vision, Computer Vision, Robotics, Deep Learning for Robotics, Optimal Estimation</i>	07/2026
B.S. in Mechanical Engineering, National Yang Ming Chiao Tung University	Hsinchu, Taiwan
<i>Courses: Robotics, Object Oriented Programming, Microcomputer System and Lab, Nonlinear Control</i>	06/2022

EXPERIENCE

Graduate Researcher, Robotics: Perception and Manipulation Lab 09/2024 - Present
Skills: Imitation Learning, Robot Perception, PyTorch, Python, OpenCV, Docker, Git, Spot robot

- Achieved category-level last-meter navigation for mobile manipulation by leading the design and implementation of a goal-conditioned policy and real-world data collection pipeline using multi-view RGB observations on Boston Dynamics Spot, resulting in an [RA-L submission](#).
- Exploring one-shot generalization for eye-in-hand manipulation by studying in-context imitation learning from a single demonstration using wrist-mounted visual observations.
- Enabled spatially-aware navigation and downstream manipulation by building [semantic topological mapping pipelines](#) using vision foundation models on Boston Dynamics Spot.
- Accelerated real-world robot learning research by designing and implementing [SpotStack](#), a modular software library for perception integration, data collection, and policy deployment on Boston Dynamics Spot.

Robotics Course Developer, CSCI 5551: Robotics, University of Minnesota 01/2026 - Present
Skills: Robot Manipulation, Robot Perception, 3D Vision, OpenCV, Python, ZED Camera

- Designed and engineered a 10-stage real-robot manipulation curriculum by integrating a 6-DoF Lite6 robotic arm and a ZED 2i stereo camera for perception-to-manipulation learning.
- Enabled rapid development of vision-based manipulation pipelines by building reusable software infrastructure, including AprilTag-based camera-to-robot calibration, grasp primitives, and camera wrapper APIs.
- Demonstrated reference solutions by implementing zero-shot target selection and 6D object pose estimation using SAM-based segmentation and oriented bounding box fitting on point clouds.
- Improved usability and reproducibility by authoring comprehensive 20-page technical documentation and starter templates.

Teaching Assistant, CSCI 5561: Computer Vision, University of Minnesota 09/2025 - 01/2026
Skills: Computer Vision, Deep Learning, Image Registration, Feature Extraction, OpenCV, Python

- Designed and maintained an automated grading system for coding assignments, enabling scalable and consistent evaluation of student submissions.
- Held weekly office hours and provided technical guidance on computer vision algorithms and deep learning methods, including feature extraction, image registration, scene recognition, and CNN implementation.

Mechanical Intern, Industrial Technology Research Institute 11/2022 - 02/2023
Skills: Automated Manufacturing, Robotics Trajectory Planning, FANUC Robot Programming

- Established an autonomous grinding production line for irregularly shaped water faucets by designing force-adaptive trajectories using dual-robot arms and a force feedback sensor.
- Improved on-site calibration efficiency by designing a coordinate transform algorithm for adaptive trajectory tuning.

Software Lead, NYCU Autonomous Underwater Vehicle (AUV) Team 🌐 02/2021 - 09/2022
Skills: C/C++, Python, ROS, Control, Sensor Fusion, Path Planning, Localization

- Spearheaded the design and implementation of the software architecture, control system, and navigation.
- Established a modular high-level/low-level robotics system by using an embedded system (STM32) for low-level attitude and motion control, and deploying ROS on Raspberry Pi and Jetson Nano for task planning and navigation.
- Reduced high-frequency noise in attitude estimation by 10% through implementing a gradient descent-based Madgwick filter on embedded hardware.
- Developed a real-time obstacle-aware navigation system by employing A* algorithm and sonar-based localization.

TECHNICAL SKILLS

Languages: C, C++, Python, MATLAB, JavaScript

Software & Tools: PyTorch, ROS, Gazebo, OpenCV, Qt, Git, Docker, SolidWorks

Robotics Platforms & Systems: Boston Dynamics Spot, FANUC robots, STM32, Raspberry Pi, Jetson Nano

PROJECTS

One-Shot Imitation Learning via Visual Servoing

11/2024 – 12/2024

- Achieved one-shot manipulation generalization by implementing a two-stage imitation learning framework combining object-centric segmentation and learned visual servoing using PyTorch and ROS.
- Enabled closed-loop end-effector control from visual observations by training a Siamese CNN servoing policy on features extracted from a FiLM-conditioned U-Net segmentation model.
- Demonstrated generalization to unseen objects by evaluating the policy in ROS Gazebo using a Kinova robotic arm.

Visual SLAM in Dynamic Environments

04/2024 - 05/2024

- Achieved 0.005 rad rotation and 0.36 m translation error by developing a visual SLAM pipeline using ORB feature matching, FLANN search, and RANSAC-based pose refinement.
- Improved robustness in dynamic scenes by filtering moving objects using scene flow and KL divergence.

LiDAR-guided Autonomous Mobile Robot in Unstructured Environments

04/2024 - 05/2024

- Achieved autonomous exploration and package delivery by developing a navigation system using LiDAR-based feature extraction for perception and the Bug algorithm for path planning on a real-world TurtleBot.

Object Assembly Using Visual Servoing

11/2023 - 12/2023

- Achieved accurate object assembly by implementing a relative pose registration pipeline using visual features and the Iterative Closest Point (ICP) algorithm in CoppeliaSim with two camera-equipped robotic manipulators.

LEADERSHIP

Appointed Treasurer, NYCU Student Association

01/2021 - 09/2021

- Allocated and managed \$30,000 budget, approved and recorded all financial transactions, and provided monthly financial reports to the Student Council.