Ethan Foong

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Education

Northwestern University, M.S. Computer Science (Combined Degree) **Mar. 2026 – Present**
GPA: 4.0/4.0

Relevant Coursework: Deep Learning for Protein Folding, Diffusion Models, Mathematical Foundations of Machine Learning, Large Language Models

Northwestern University, B.S. Computer Engineering **Sept. 2023 – Present**
GPA: 4.0/4.0

Relevant Coursework: Machine Learning, Robotics, Mechatronics, Linear Algebra, Diff. Equations

Publication

1 **HANDFUL: Sequential Grasp-Conditioned Dexterous Manipulation with Resource Awareness**
Ethan Foong*, *Yunshuang Li**, *Hao Jiang, Gaurav Sukhatme, Daniel Seita*
In Submission [PDF] [Website]

Professional Experience

Undergraduate Researcher **Mar. 2026 – Present**
Machine Learning and Language Lab, Northwestern University

- Exploring how world models can support robot learning with Prof. Manling Li and Qineng Wang. Investigating how video world models or other learned models can allow for goal-directed exploration and action generation to complement traditional VLA or RL-based actors. (Ongoing)

SURE Research Fellow **June 2025 – Mar. 2026**
SLURM Lab, University of Southern California

- Led development of HANDFUL, a dexterous manipulation framework where a LEAP hand learns resource-aware grasping strategies via curriculum-based Soft Actor-Critic, enabling skill composition like picking multiple objects up at once or picking up on object and opening a drawer with the same hand. Designed reinforcement learning training pipeline, curriculum, and accelerated training with CUDA Graphs; contributed to data preprocessing for sim-to-real transfer.
- Designed and implemented a multi-functional manipulation benchmark in ManiSkill spanning tasks requiring simultaneous skill execution (e.g., grasp-and-twist, grasp-and-push); used to evaluate HANDFUL against baseline and SOTA learning frameworks.
- Built a cross-platform teleoperation system for dexterous hand-arm setups supporting the Rokoko mocap glove, Allegro and LEAP hands, and xArm7; enables high-fidelity demonstration collection for imitation learning in tabletop dexterous manipulation settings.

Undergraduate Research Assistant **Jan. 2024 – June 2025**
IDEAS Lab, Northwestern University

- Improved SLAM accuracy by 50% on an autonomously navigating Unitree Go1 in a research setting by fusing RGB-D and 3D LiDAR data with SLAM Toolbox in ROS 2, implementing sensor preprocessing pipelines, and tuning pose graph optimization parameters.
- Designed and validated a 2D pose graph SLAM system for differential-drive robot integrating LiDAR and wheel encoders, achieving 85% localization improvement over raw odometry; implemented in C++ with ROS 2 and verified across Gazebo simulation and hardware deployment.

Awards

SURE Research Fellowship - USC 2025
SURG Research Grant - Northwestern University 2024

Service

Workshop Reviewer: ICRA — 2026

SAT, ACT, and AP Tutor with Applerouth — Sept. 2025 - Present

RSS Volunteer — 2025

Peer Mentor for CS 213: Northwestern University — Winter 2025, Spring 2025

Presentations and Leadership

Northwestern Undergraduate Research Expo Poster Presentation — 2026

Software Lead - Northwestern Robotics Club — Sept. 2023 - June 2025

Technical Skills

Languages: Python, MATLAB, C, C++, HTML/CSS, LaTeX
Developer Tools: VS Code, Anaconda, Docker
Technologies/Frameworks: Linux, PyTorch, Solidworks, GitHub, ROS, Robotics Sim (Maniskill, Isaac Gym, Gazebo), CUDA Graphs
Hardware: LEAP and Allegro Hands, xArm7, Unitree Go1, Teleoperation Gloves