
Education**University of Michigan***M.S. in Computer Science***Class of 2025***Ann Arbor, MI*

- Relevant Coursework: Mobile Robotics, Robot Kinematics and Dynamics, Continuous Optimization, Intro Topology, Intro Complex Analysis, Computer Architecture
- Graduate Teaching Assistant for Intro Autonomous Robotics class.

University of Michigan*B.S. in Computer Science, Minor in Mathematics, Overall GPA: 3.86/4.0***Class of 2024***Ann Arbor, MI*

- Relevant Coursework: Machine Learning, Computer Vision, Intro Real Analysis, Probability Theory, Advanced Linear Algebra, Operating Systems, Data Structures & Algorithms, Signals and Systems, Embedded Systems

Publications**Language-Gesture Controlled Video Generation for Robot Planning****ICRA 2025***Paper: <https://arxiv.org/abs/2407.05530>, Website, GitHub, Hugging Face**Advised by JJ Park and Nima Fazeli*

- Achieve robot planning by leveraging video diffusion models trained on internet-scale data (Bridge Dataset).
- Tackle three fundamental challenges in video-based planning: 1) unambiguous task communication with simple human instruction, 2) controllable video generation that respects user intent, and 3) translating visual plans into robot actions.
- Propose language-gesture conditioning to generate video, which is clearer than existing language-only methods.
- Introduce a behavioral cloning model that converts video plans into executable robot actions.
- Boost pick and place accuracy in simulated environments by up to 47% compared to previous SOTA method (AVDC).

Work and Research Experience**ILIAD Lab @ Stanford University****Summer 2023***Student Researcher**Advised by Dorsa Sadigh*

- Improved bimanual manipulation using smarter object affordance models.
- Key insight: objects have semantically meaningful axes, some around which we should constrain motion.
- Researched vision models, including RNNs, transformers, and VAEs, to extract these constraints from human demos.
- Used object-centric constraints to guide downstream planning (MPC and model-based RL).

Nimble Robotics**Summer 2021, 2022***Robotics Engineer Intern**San Francisco, CA*

- Automated piece-picking, sorting, and packing solutions for eCommerce order fulfillment.
- Collaborated with software teams across all divisions to build a pipeline that generates, logs, and display visual data in a portable 3D web viewer when robot plans a pick. Streamlined the debugging process.
- Replaced old networking systems (ZeroMQ) with ROS architecture, providing a modern mechanism by which robot state machines can retrieve and process hardware feedback.
- Developed firmware for Arduino Nano Every board to control a suction gripper - enabling robots to pick multiple items simultaneously using different channels. Required controlling solenoids and reading ADC voltage from pressure sensors.
- Researched firmware simulation for our robot by supporting emulation of our STM32 micro controller via Renode.

Personal Projects**optHIM: Hybrid Iterative Methods for Continuous Optimization****Spring 2025***Paper: <https://arxiv.org/abs/2505.04137>, GitHub*

- Developed suite of GPU-accelerated unconstrained optimization algorithms using PyTorch for automatic differentiation.
- Library includes support for line search (GD, Newton, BFGS, L-BFGS, DFP) and trust region (CG) methods.

Motion Planning for Robotic Manipulators**Spring 2022**

- Built web simulator for any n-link robot with an XML specification using a forward kinematics tool.
- Added option for simulated robots to perform inverse kinematics via the Jacobian transpose method.
- Designed RRT-connect algorithm to plan obstacle-free paths for the Fetch robot.

Achievements & Awards**USA Computing Olympiad (USACO), Platinum Level****June 2017 – August 2020**