Yazhou (Harry) Zhang

Stanford, CA • yazhou-hzhang.github.io
zhangyaz@stanford.edu • +1 (778) 889-9650

EDUCATION

Stanford University — California, U.S.
Master of Science in Mechanical Engineering — *Expected 06/2026*
Focus Areas: Robotics and Kinematics (Depth), Automatic Controls and Dynamics (Breadth) — *GPA: 4.0*

University of Toronto — Ontario, Canada
Bachelor of Applied Science in Mechanical Engineering — *09/2019 – 05/2024*
Minors: Robotics and Mechatronics, Engineering Business — *GPA: 3.9*

SKILLS & INTERESTS

Programming: C++, Python, MATLAB
Robotics & Simulation: ROS2, MuJoCo, Pinocchio, Isaac Gym, Gazebo
Control & Learning: Impedance & Admittance Control, PPO, MPC, iLQR, LQR
Systems & Hardware: Linux (Ubuntu), Git, Docker, motor control, encoders, IMUs, force/torque sensing
CAD & Analysis: SolidWorks, ANSYS, AutoCAD, Creo

INTERNSHIP & RESEARCH EXPERIENCES

XPENG Humanoid | Dexterous hand manipulation — Shenzhen, China
Embodied Intelligence Intern — *05/2025 – 09/2025*

- Designed and deployed an admittance-controlled dexterous hand, enabling safe manipulation of fragile objects (e.g., balloons, chips) and compliant reverse-bending behavior under rigid contact.
- Reduced control latency from 40 ms to 0.2 ms by replacing NLopt-based optimization with a direct qpos formulation, and developed a retargeting similarity analysis pipeline enabling 30+ pose evaluations in 5 minutes for rapid tuning and iteration.
- Implemented and evaluated state-of-the-art dexterous manipulation pipelines (DexGen, ManipTrans), including any-grasp-to-any-grasp generation, PPO-based trajectory optimization, diffusion-based retargeting filtering, and object-aware imitation + reinforcement learning.

Salisbury Lab | Tendon Actuated Robotic Arm — California, U.S.
Research Assistant — *01/2025 – 06/2025*

- Developed real-time impedance-based position and torque controllers for a tendon-actuated robotic arm, achieving stable trajectory tracking and on-the-fly compliance adjustment on 1-DOF and 3-DOF hardware systems.
- Implemented stiffness perception from motor position and torque feedback to infer material properties, enabling adaptive interaction with objects exhibiting linear and nonlinear (stiffening) compliance.

RELEVANT ENGINEERING PROJECTS

Perception for Robotic Pick-and-Place: Modular vs End-to-End Approaches — *09/2025 – 12/2025*

- Built a full pose-based pick-and-place pipeline in PyBullet (UR5 + RGB-D), integrating U-Net segmentation, point-cloud generation, ICP pose estimation, IK-based motion, and grasp execution with success checking.
- Implemented an end-to-end affordance learning approach using dense spatial action maps over 8 discrete rotation bins, improving cluttered pick success from 8/15 to 15/15 objects via failure-aware suppression.

Mobile Manipulation System for Autonomous Kitchen Tasks — *03/2025 – 06/2025*

- Built a full sim-to-real mobile manipulation pipeline using MuJoCo and OpenSai, validating perception and full-stack control for safe deployment on a mobile manipulator.
- Designed a hierarchical finite-state machine integrating vision, motion planning, and force/trajectory control to execute 10+ multi-stage kitchen tasks (e.g., grasping, pouring, compliant button pressing) with centimeter-level accuracy and stable contact transitions.

Frontier Exploration on TurtleBot — *09/2024 – 12/2024*

- Developed a ROS2-based frontier exploration system with EKF-based SLAM, integrating ICP scan matching for pose refinement and online occupancy grid mapping, and A* planning for frontier-driven navigation; achieved 100% mapping accuracy in simulation and 82% coverage on hardware.