

Yixiao Liu

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EDUCATION

University of Pennsylvania

M.S.E. in Mechanical Engineering and Applied Mechanics (3+2 Program)

- Exchange Scholarship (Tuition Waived)

Philadelphia, PA

Aug. 2025 – Present

Shanghai Jiao Tong University

B.S. in Mechanical Engineering

Shanghai, China

Aug. 2022 – Present

RESEARCH EXPERIENCE

Research Intern, World Models and 3D Reconstruction

2026 – Present

Advised by Jiatao Gu, University of Pennsylvania

- Conducted research on learning-based world models for robotic perception, focusing on structured 3D scene representation and reconstruction from visual observations.

Fruit Detection, Tracking and Counting

2025 – Present

Advised by Chenggang Yuan, Shanghai Jiao Tong University

- Analyzed detection–tracking pipelines for agricultural robotics by comparing YOLO-based detectors with SORT-family multi-object trackers.
- Designed a lightweight detection–tracking–counting framework to improve counting robustness under occlusion and viewpoint changes.
- Investigating detector compression and tracker simplification strategies to balance tracking stability and real-time performance on embedded robotic platforms.

PROJECTS

MEAM 5100: Robotics and Autonomous Systems Project (ROBA)

Fall 2025

University of Pennsylvania

- Designed and implemented a robotic system for the MEAM 5100 ROBA competition.
- Achieved **3rd team place out of 113 students** on ROBA competition.
- Integrated perception, planning, and control modules under real-time constraints.

Optimal Control for Nonlinear Dynamical Systems

Fall 2025

University of Pennsylvania

- Implemented LQR and MPC controllers for nonlinear systems in simulation.
- Built a trajectory optimization pipeline and analyzed control performance trade-offs.
- Compared different horizons and cost weightings using quantitative visualizations.

UR16e Manipulator Modeling and Simulation

Spring 2025

Shanghai Jiao Tong University

- Modeled kinematics and dynamics of a 6-DOF UR16e manipulator using modified DH parameters.
- Validated torque-based control and motion planning in MATLAB/Simulink.

Upper-Limb Rehabilitation Robot Design

Fall 2024

Shanghai Jiao Tong University

- Designed a rehabilitation robot system including mechanical structure, actuation, and control logic.
- Implemented motion control and safety constraints; completed full system integration and testing.
- Received Outstanding Course Project Award for system design and integration quality.

TECHNICAL SKILLS

Programming: Python, MATLAB, C++, Git

Robotics & Control: LQR, MPC, Dynamic Modeling, Simulation

Vision & ML: Object Detection (YOLO), Multi-Object Tracking, PyTorch (basic)

RESEARCH INTERESTS

Robotic Perception; Object Detection and Tracking; 3D Vision; Learning-based Control