Yihan Li

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Research Interests

My research interest lies on robot learning and control in pHRI scenarios, currently with a particular emphasis on whole-body manipulation. I aim to develop adaptive, efficient, and safe robotic systems that robustly interact with dynamic physical environments and support smooth human–robot collaboration. I'm actively seeking for opening PhD positions in 2026Fall.

Education

University of Pennsylvania *August 2024 – Present*
Master in Robotics, GRASP Lab
GPA: 3.65/4.0
Courses: Masters Independent Study(A), Machine Perceprion(A+), Control and Optimization with Applications in Robotics(A-), Vision-based Robot Learning, Learning and Control for Adaptive and Reactive Robots, etc.

Xi'an Jiaotong Univerity *September 2020 – July 2024*
Bachelor of Automation Engineering, QianXuesen Honor College
Average Score: 86/100
Main courses: Operations Research, Automatic Control Theory, Machine Learning, Numerical Analysis, Circuit, Analog and Digital Electronic Technology, etc.

University of California, Berkeley *August 2022 – December 2022*
Visiting Student, EECS
GPA: 3.78/4.0
Selected courses: Signals and Systems (A), Data Structures (A-), Introduction to Control of Unmanned Aerial Vehicles (A-), Introduction to Embedded and Cyber Physical Systems (A-)

Publications

[1] George Jiayuan Gao*, Tianyu Li*, Junyao Shi, **Yihan Li**, Zizhe Zhang, Nadia Figueroa, and Dinesh Jayaraman. "VLMGINEER: Vision Language Models as Robotic Toolsmiths". In: *Oral Spotlight at RSS 2025 Workshop on Robot Hardware-Aware Intelligence, Under Review* (2025).

[2] Tianyu Li*, **Yihan Li***, Zizhe Zhang, and Nadia Figueroa. "Flow with the Force Field: Learning 3D Compliant Flow Matching Policies from Force and Demonstration-Guided Simulation Data". In: *Under Review* (2025).

[3] Yifan Zeng*, **Yihan Li***, Suiyi He, Koushil Sreenath, and Jun Zeng. "IteraOptiRacing: An Unified Planning-Control Framework for Real-time Autonomous Racing for Iterative Optimal Performance". In: *Under Review of IEEE Transactions on Control Systems Technology(TCST)* (2025).

[4] Yifan Zeng*, Suiyi He*, Han Hoang Nguyen, **Yihan Li**, Zhongyu Li, Koushil Sreenath, and Jun Zeng. "i2LQR: Iterative LQR for Iterative Tasks in Dynamic Environments". In: *Published on 2023 62nd IEEE Conference on Decision and Control (CDC)* (2023).

Research Experience

University of Pennsylvania, Figueroa Lab *September 2024 – Present*
Advisor: Prof. Nadia Figueroa @Upenn GRASP Lab

- Proposed *Flow with the Force Field*, a framework for generating force-informed data in simulation, instantiated by a single human demonstration, and show how coupling with a compliant policy improves the performance of a visuomotor policy learned from synthetic data. The framework is validated on real-robot tasks, including non-prehensile block flipping and a bi-manual object moving, where the learned policy exhibits reliable contact maintenance and adaptation to novel conditions.

- Proposed a hierarchical MPPI framework in joint torque space for mobile manipulator control. Currenly leading a robot hockey-puck project based on Tidybot++, which requires the robot to be compliant, reactive and agile in whole-body level and perform multiple contact-rich motions like hitting, dribbling and scoring while adapt behavior modes according to the environment.

ETH Zurich, Robotics Student Fellow in Robotic Systems Lab *June 2025 – August 2025*
Advisor: Prof. Marco Hutter, Dr. Vaishakh Patil @ETH
During RSF, I developed a multimodal, injury-adaptive in-hand manipulation policy for the Allegro hand on the repose task, using a teacher–student framework in which a privileged teacher (access to ground-truth object and injury states) supervises a student distilled via behavior cloning from real-world sensory inputs..

UC Berkeley, Hybrid Robotics Group *September 2022 – June 2024*
Advisor: Prof. Koushil Sreenath @UC Berkeley

- Proposed i2LQR(Iterative Learned Iterative Linear Quadratic Regulator), a novel joint strategy that unifies planning and control for dynamic environments and demonstrated in stochastic, dynamic car-racing tasks that it outperforms state-of-the-art LMPC.

- Developed an iterative MPPI framework with regrouping–resampling that unifies scenario generation, planning, and control, enabling the algorithm to automatically work out the overtaking tendency of static obstacles in car racing scenarios and bridging the planning process with trajectory generation

Southern University of Science and Technology, CLEAR Lab *March 2024 – June 2024*
Advisor: Prof. Wei Zhang @SUSTech
Constructed an imitation learning framework on ARX5 using diffusion policy with UMI grippers for data collection. Explored the possibility of using Gaussian Splatting for data generation in imitation learning.

Past Projects

Whole-body Control for Force-attending Mobile Manipulation *Master's Independent Study, Dec. 2024*
Presented a Hierarchical MPPI (Model Predictive Path Integral) framework, which integrates MPPI components at both higher-level decision makers and lowerlevel interactive controllers. This hierarchical structure enables sharing of cost function information between levels, enhancing overall system performance.

Adapting to Injuries for Dexterous In-Hand Manipulation *ETH RSF Project, Aug. 2025*
Developed a multimodal, injury-adaptive in-hand manipulation policy for the Allegro hand on the repose task.

A United Framework of Controller and Behavior Planner: Iterative-Regrouping MPPI
Undergraduate Thesis, Jun. 2024
Presented an iterative MPPI framework with regrouping–resampling that unifies scenario generation, planning, and control.

Awards

Third prize in 2022 China Robot Competition *April 2022*
Xi'an Jiaotong University Scholarship *October 2021*
QianXuesen Honor College Outstanding Student of the Year *October 2021*

Professional Service

Reviewer for International Conference on Robotics and Automation (ICRA) *2023*
Volunteer for Robotics: Science and Systems(RSS) *2025*

Skills

Programming Language: C/C++, Python, Java, Matlab
Tools: PyTorch, ROS, Pybullet, IsaacLab, Isaacgym, ManiSkill
Hardware: Franka, FACTR Teleop, Arduino, Raspberry Pi