Ziyan Li

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EDUCATION

Shanghai Jiao Tong University (SJTU) Shanghai, China

Bachelor of Engineering in Computer Science Sept. 2022 – Present

- **ACM Honor Class**: An elite CS program for the top 5% talented students at SJTU.
- **Selected Courses:** Programming Practices: 94, Large Language Model: 98.8, Machine Learning: 91, Computer Vision 100, Visual Content Generation: 95, Reinforcement Learning: 91

RESEARCH Interest

- My research interests lie in **Robot Learning** and **Reinforcement Learning**.
- My research goal is to develop embodied agents that can **generalize** robust behaviors across complex, open-world environments.

RESEARCH EXPERIENCE

RoboVision Lab, University of Illinois Urbana-Champaign IL, United States

Research Intern, advised by **Prof. Saurabh Gupta** May 2025 – Present

Project: Learning Humanoid End-Effector Control for Open-Vocabulary Visual Loco-Manipulation

- Addressed the limited generalization of imitation learning-based humanoid loco-manipulation due to the difficulty in collecting large-scale real-world demonstrations.
- Designed a residual-aware end-effector tracking policy that integrates classical robotics with machine learning: (a) inverse kinematics for converting residual targets into reference trajectories, (b) a learned neural forward model for accurate forward kinematics, (c) goal adjustment, and (d) replanning mechanisms, achieving 3.2× reduction in end-effector tracking error.
- Built a modular loco-manipulation system leveraging open-vocabulary large vision models for visual understanding, enabling the humanoid robot to reliably manipulate various everyday objects (markers, apples, toys) across diverse real-world environments (offices, coffee shops) on surfaces ranging from 43cm to 87cm in height with 90% success rate.
- Conducted systematic modular and end-to-end evaluations in both simulation and real-world settings, demonstrating that the proposed design significantly outperforms existing approaches and opens new pathways for training humanoid robots for object interaction.
- **Co-lead** the project; under review at **RSS 2026**.

APEX Lab, Shanghai Jiao Tong University Shanghai, China

Research Intern, advised by **Prof. Weinan Zhang** July 2024 – June 2025

Project: USR: Unified Latent Steering and Residual Refinement for Online Improvement of Diffusion Policy Models

- Identified complementary limitations of online adaptation methods in manipulation: sample steering is constrained by the base policy, and residual refinement requires fragile step-size tuning.
- Proposed USR, a unified online adaptation algorithm for diffusion policies that employs a single lightweight actor to jointly generate noise and refine trajectories, enabling multimodal steering and controlled policy deviation without parameter updates of the pretrained policy.
- Released MultiModalBench, a benchmark of six robot manipulation tasks with multiple demonstration modes, providing the first systematic testbed for multimodal policy adaptation.
- Demonstrated the real-world applicability of USR by effectively improving a VLA model on a physical robot, validating its potential for scalable fine-tuning of behavioral foundation models.
- **Co-lead** the project; under review at **ICML 2026**. paper draft

PROJECT EXPERIENCE

RAY_TRACER *Rust*

- Achieved highly realistic image rendering by implementing path tracing algorithms to simulate light intensity changes of single rays.
- Modeled objects with varying shapes and materials (dielectrics, metals) based on the *Ray Tracing in One Weekend* series.
- Implemented 7k lines of code in **Rust**. [Code]

Parkour but Safe: Agile Navigation with Parkour Skills *Python, RL*

- Developed a hybrid navigation framework that dynamically switches between parkour skills and obstacle avoidance to balance agility and safety.
- Designed a depth-based policy selector to analyze environmental complexity and execute the optimal strategy, validating improved reliability in simulation.
- Implemented 5k lines of code in **Python**. [Webpage]

Mx* COMPILER *Java, RISC-V*

- Designed a compiler transforming a C/Java-like language (Mx*) to RV32I Assembly.
- Realized a complete pipeline including semantic checking, IR generation, and code optimization.
- Optimized the translation from IR to assembly using the Graph Coloring Register Allocation algorithm.
- Implemented 8k lines of code in **Java**. [Code]

RISC-V CPU *Verilog*

- Designed a RISC-V CPU featuring Write Buffer, ICache, and Branch Prediction.
- Implemented Out-of-Order execution using the Tomasulo algorithm.
- Utilized Vivado to generate bitstream and program the FPGA board.
- Implemented 3k lines of code in **Verilog**. [Code]

TECHNICAL SKILLS

- **Robot Platforms**: Unitree G1, XArm
- **Programming**: Python, C++, Java, Rust, Verilog
- **Tools & Frameworks**: PyTorch, Isaac Gym, Isaac Sim, MuJoCo, ROS
- **Languages**: English (TOEFL iBT: 101), Chinese (Native)

SELECTED HONORS AND AWARDS

- **2022 Zhiyuan Honors Scholarship**, top 2% Dec 2022
- **2023 Zhiyuan Honors Scholarship**, top 2% Dec 2023
- **2024 Zhiyuan Honors Scholarship**, top 2% Dec 2024
- **2025 Zhiyuan Honors Scholarship**, top 2% Dec 2025

TEACHING EXPERIENCE

- **Programming Practice** Jun. - Jul. 2024
- **Computer Architecture** Sep. - Dec. 2024

Role: teaching assistant. Work includes giving lectures, writing guidebooks or guiding documents, creating exam questions, etc