Zeju Li

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Education

Zhejiang University Hangzhou, Zhejiang, China
B.Eng in Computer Science and Technology

- College of Computer Science and Technology *Sept. 2025 - Present*
- Mixed Class, Chu Kochen Honors College *Sept. 2023 - June. 2025*

Research Interest

I'm passionate about developing truly intelligent robots, enabling general-purpose robot autonomy in human-centric environments. My research primarily lies in generalizable behavior planning and action learning for complex, long-horizon tasks by developing algorithms that integrate world models, imitation learning, and reinforcement learning.

Research Experience

Zhejiang University Hangzhou, Zhejiang, China
Research Assistant at State Key Lab of CAG&CG *Oct. 2024 - Present*
Advised by Prof. Chen Hao and Prof. Chunhua Shen

Model-based Reinforcement Learning with Compact State Representations
Oct. 2025 - Present

- Try to integrate the compact state representations with model-based reinforcement learning process to help with reward estimation.
- Try to build thinking-with-states and chain-of-thoughts mechanism in both high-level task planning and low-level robot manipulation control.

Reconstructing, Generating, and Retargeting Hand-Object Interactions
Sept. 2025 - Present

- Try to propose a framework for interaction reconstruction, generation, and retargeting to simulation environments from hand-object interaction.
- Try to build a novel pipeline of generating data for dexterous manipulation from hand-object videos on the Internet.

Compact State Representations for Efficient World Modeling and Action Learning
July. 2025 - Sept. 2025

- Introduced an unsupervised approach that learns a highly compressed two-token state representation, which is efficient, interpretable, and integrates seamlessly into existing VLA-based models.
- Studied the representation to find an emergent capability where the difference between representation tokens functions as a highly effective latent action, decodable into executable robot actions.
- Proposed an approach for learning generalizable robotic motion from static images via compact state representations, eliminating the need for complex architectures and video data.

Language-guided Long-horizon Mobile Manipulation
June. 2025 - Aug. 2025

- Built a unified mobile manipulation framework for agile quadruped robots equipped with manipulators, which seamlessly integrates high-level task planning with low-level whole-body control.
- Introduced a hierarchical vision-language planner that bridges egocentric perception and language-conditioned tasks, decomposing long-horizon instructions into executable actions.
- Proposed the first whole-body control policy that generalizes to challenging terrains while jointly coordinating locomobility and manipulation.
- Presented the first benchmark for long-horizon mobile manipulation, evaluating diverse indoor and outdoor scenarios.

Publications

Preprints

StaMo: Unsupervised Learning of Generalizable Robot Motion from Compact State Representation
Mingyu Liu*, Jiuhe Shu1*, Hui Chen, Zeju Li, Canyu Zhao, Jiange Yang, Shenyuan Gao, Hao Chen, Chunhua Shen
Under review, 2025 [Paper] [Project Page]

ODYSSEY: Open-World Quadrupeds Exploration and Manipulation for Long-Horizon Tasks
Kaijun Wang*, Liqin Lu*, Mingyu Liu, Jianuo Jiang, Zeju Li, Bolin Zhang, Wancai Zheng, Xinyi Yu, Hao Chen, Chunhua Shen
Under review, 2025 [Paper] [Project Page]

Projects

MiniSQL Database Management System

The course project of Database Systems and Concepts. Created a 20k-line MiniSQL database management system in C++ based on CMU-15445 BusTub framework. Architected and implemented its core components, including a Buffer Pool Manager (LRU/bitmap), a heap-based Record Manager, and a B+ Tree Index Manager.

32-bit RISC-V CPU

The course labs of Computer Organization and Design & Computer Architecture. Designed and implemented a 5-stage pipelined RISC-V CPU supporting the RV32I and partial RV32F instruction sets. Developed a custom ALU for floating-point operations and deployed the design on an FPGA using Verilog and Vivado.

Parallel Optimization Practices

The course labs of High Performance Computing 101 summer course and competition project in Parallel Application Challenge (PAC) 2024.

Skills

Programming Python(Pytorch), C/C++, LaTeX, SQL, Linux
Language Chinese (Native), English (TOEFL 100/120, *Sept. 2025*)