

YUSEN LUO

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EDUCATION

University of Southern California

Master in Computer Science

Sep 2023 - May 2025

Los Angeles, US

Beijing Jiaotong University

Bachelor in Computer Science

Sep 2019 - May 2023

Beijing, CN

RESEARCH INTEREST

My research focuses on enabling robots to efficiently learn and adapt to new tasks with minimal supervision. I am interested in **1)** scaling robot learning from off-domain sources (e.g., internet-scale videos, generative models) and **2)** developing efficient post-training paradigms for rapid real-world adaptation. My goal is to build autonomous robot capable of continual self-improvement and robust generalization across diverse tasks and unseen environments in real world.

PUBLICATIONS & PREPRINTS

- Chancharik Mitra*, **Yusen Luo***, Raj Saravanan*, Dantong Niu, Anirudh Pai, Jesse Thomason, Trevor Darrell, Abrar Anwar, Deva Ramanan, Roei Herzig. “Mechanistic Finetuning of Vision-Language-Action Models via Few-Shot Demonstrations”, *Under Review at CVPR 2026*. [Website] [Paper]
- Jiahui Zhang*, **Yusen Luo***, Abrar Anwar*, Sumedh Anand Sontakke, Joseph J. Lim, Jesse Thomason, Erdem Biyik, and Jesse Zhang. “ReWiND: Language-Guided Rewards Teach Robot Policies without New Demonstrations”, ***Oral Presentation at CoRL 2025, Best Paper Reward at RSS 2025 OOD Workshop, Best Paper Nomination at RSS 2025 RoboReps Workshop***. [Website] [Paper] [Code]

* Indicates Equal contribution.

RESEARCH EXPERIENCE

Mechanistic Finetuning of Vision-Language-Action Models via Few-Shot Demonstrations

Berkeley Artificial Intelligence Research (BAIR), UC Berkeley

June 2025 - Present

Advisor: *Dr. Roei Herzig, Prof. Trevor Darrell*

- Developed a mechanistic fine-tuning approach that selectively adapts attention heads in VLA models based on task-specific physical, visual, and linguistic factors
- Demonstrated superior robustness by reducing overfitting and catastrophic forgetting compared to LoRA and enabled faster and more interpretable adaptation of foundation models to diverse robotic tasks

Latent Action World Modeling

Learning and Interactive Robot Autonomy Lab, USC

Oct 2025 - Present

Advisor: *Prof. Erdem Biyik*

- Developing a framework that jointly pre-trains latent action and world models on action-free videos, fine-tunes via online robot interaction to ground latent to real actions, and leverages learned dynamics for model-based RL
- Targeting RSS 2026

ReWiND: Language-Guided Rewards Teach Robot Policies without New Demonstrations

Learning and Interactive Robot Autonomy Lab, USC

Mar 2024 - May 2025

Advisor: *Prof. Erdem Bıyık, Prof. Jesse Thomason*

- Developed a language-conditioned reward model enabling sample-efficient robot learning from minimal demonstrations without additional per-task supervision
- Implemented offline-to-online RL framework achieving $2\times$ improvement in simulation and $5\times$ improvement for real-world bimanual policies within 1 hour

RESEARCH MENTORING

Haobai Zhan

Current

M.S. Student at USC (Advised by *Prof. Erdem Bıyık*)

AWARDS AND SCHOLARSHIPS

Best Paper Award (ReWiND) , OOD Workshop RSS

June 2025

Best Paper Nomination (ReWiND) , RoboRep Workshop RSS

June 2025

Scholarship for Academic Excellence , Beijing Jiaotong University

Oct 2021