YUSEN LUO

(+1) 323 687 7695 yusenluo@usc.edu Γ Google Scholar X @yusen_2001 Homepage

EDUCATION

University of Southern California *Sep 2023 - May 2025*
Master in Computer Science Los Angeles, US
Beijing Jiaotong University *Sep 2019 - May 2023*
Bachelor in Computer Science 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 extracting rich world representations from foundation models and grounding them through real-world robot interactions to achieve rapid task acquisition across diverse environments. My goal is to develop methods that enable robots to achieve broad generalization and robust performance across diverse real-world tasks and environments.

PUBLICATIONS & PREPRINTS

- Chancharik Mitra*, **Yusen Luo***, Raj Saravanan*, Dantong Niu, Anirudh Pai, Jesse Thomason, Trevor Darrell, Abrar Anwar, Deva Ramanan, Roei Herzig. "Robotic Steering: Mechanistic Finetuning for Vision-Language-Action Models", *In submission, 2026.*
- 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***.

* *Indicates Equal contribution.*

RESEARCH EXPERIENCE

Berkeley Artificial Intelligence Research (BAIR) *May 2025- Current*
Advisor: *Roei Herzig*
Co-leading project: Robotic Steering: Mechanistic Finetuning for Vision-Language-Action Models

- Developed a mechanistic fine-tuning approach that selectively adapts attention heads in Vision-Language Action models based on task-specific physical, visual, and linguistic requirements
- Demonstrated superior robustness and compute efficiency compared to standard LoRA fine-tuning through comprehensive robot evaluations, enabling faster and more interpretable adaptation of foundation models to diverse robotic tasks.

Learning and Interactive Robot Autonomy Lab *Jan 2024- Current*
Advisor: *Prof. Erdem Biyik*
Co-leading project: Latent Action World Modeling

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

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

- Developed a language-conditioned reward model that enables sample-efficient robot learning from minimal demonstrations, eliminating the need for additional per-task supervision.

- Implemented an offline-to-online RL framework that achieved 2× performance improvement in simulation and 5× improvement for real-world bimanual policies within 1 hour of training

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*