

# YUSEN LUO

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## EDUCATION

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**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

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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

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- Chancharik Mitra\*, **Yusen Luo\***, Raj Saravanan\*, Dantong Niu, Anirudh Pai, Jesse Thomason, Trevor Darrell, Abrar Anwar, Deva Ramanan, Roei Herzig. “Robotic Steering: Mechanistic Fine-tuning 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*. [Website] [Code]

\* Indicates Equal contribution.

## RESEARCH EXPERIENCE

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**Berkeley Artificial Intelligence Research (BAIR)**

*May 2025- Current*

Advisor: *Roei Herzig, Prof. Trevor Darrell*

Co-leading project: Mechanistic Finetuning of Vision-Language-Action Models via Few-Shot Demonstrations

- 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 in multiple variations by reducing overfitting and catastrophic forgetting compared to LoRA 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 to real 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  $2\times$  performance improvement in simulation and  $5\times$  improvement for real-world bimanual policies within 1 hour of training

## AWARDS AND SCHOLARSHIPS

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<b>Best Paper Award (ReWiND)</b> , OOD Workshop RSS	<i>June 2025</i>
<b>Best Paper Nomination (ReWiND)</b> , RoboRep Workshop RSS	<i>June 2025</i>
<b>Scholarship for Academic Excellence</b> , Beijing Jiaotong University	<i>Oct 2021</i>