

# YUSEN LUO

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## EDUCATION

### University of Southern California

Master in Computer Science

### Beijing Jiaotong University

Bachelor in Computer Science

Sep 2023 - May 2025

Los Angeles, US

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 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, Prof. Trevor Darrell

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  $2\times$  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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**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*