YUSEN LUO

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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
Graduated with First-Class Honor

RESEARCH INTEREST

My research focuses on enabling robots to efficiently learn and adapt to new tasks with minimal supervision through foundation model-based approaches. I am interested in developing scalable learning frameworks that leverage pre-trained models and structured guidance to achieve rapid task acquisition across diverse environments. My goal is to advance autonomous robot learning methods that bridge the gap between foundation models and real-world deployment, moving toward more adaptable and capable robotic systems.

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 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**.

* 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: 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

PROJECTS

Reward-Induced Representation Learning
Nov 2023 - Jan 2024
Advisor: *Jesse Zhang*

- Developed a reward-induced representation learning framework that uses various reward signals prediction to learn focused visual representations, filtering out irrelevant environmental information for improved RL efficiency

- Achieved faster RL convergence and improved robustness to visual distractors compared to baseline methods, with pre-trained representations enabling more sample-efficient downstream learning than training from scratch.

Multi-LLM for Better Story Generation
Sep 2024 - Nov 2024
Project Leader

- Developed a multi-agent story generation framework using predefined narrative arcs (e.g., "Rags to Riches," "Oedipus") and structured turning points, with Agent 1 generating story outlines and Agent 2 expanding them into complete narratives through supervised fine-tuning.

- Achieved superior performance compared to baseline models in human and LLM evaluations across 8 story quality metrics, with particularly strong results on complex tragic arcs like Oedipus where the framework outperformed even human-authored stories.

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*