

Zhaoyang Li

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Education

MS University of California San Diego

- Electrical and Computer Engineering (Intelligent Systems, Robotics & Control)

Sep 2023 - Jun 2025

BS University of Wisconsin-Madison,

- Double Major in Computer Science & Mathematics

Jan 2021 - May 2023

Research Interests

My research focuses on developing embodied agents that perceive, reason, and act in the physical world. I work at the intersection of **mimetic learning**, **robot learning**, **vision-language-action (VLA) integration**, and **preference alignment**, with a focus on (1). improving the robustness of vision–language models and their applications, (2). developing efficient control and planning policies, (3). integrating VLA systems into unified embodied agents, and (4). aligning agent behavior with human intentions through feedback and preferences. Ultimately, I aim to build reliable, interpretable agents that generalize to real-world environments.

Publications & Preprints

* indicates equal contributions.

- 1. **Zhaoyang Li***, Zhan Ling*, Yuchen Zhou, Litian Gong, Erdem Biyik, Hao Su. “ORIC: Benchmarking Object Recognition under Contextual Incongruity in Large Vision-Language Models.”, in Proceedings of the IEEE / CVF Computer Vision and Pattern Recognition Conference (**CVPR**), 2026 [\[Paper\]](#) ↗ [\[Code\]](#) ↗
- 2. **Zhaoyang Li**, Sushaanth Srinivasan, Ninad Ekbote, Pengtao Xie. “A Multi-modal Large Language Model for Predicting Mechanisms of Drug Interactions.” Submitted to **Nature Biomedical Engineering**.
- 3. Tongzhou Mu*, **Zhaoyang Li***, Stanisław Wiktor Strzelecki*, Xiu Yuan, Yunchao Yao, Litian Liang, Aditya Gulati, Hao Su. “When Should We Prefer State-to-Visual DAGGER Over Visual Reinforcement Learning?”, in Proceedings of the AAAI Conference on Artificial Intelligence (**AAAI**), 2025 [\[Paper\]](#) ↗ [\[Code\]](#) ↗
- 4. Yifei Zhang, Yusen Jiao, Jiayi Chen, **Zhaoyang Li**, Huaxiu Yao, Jieyu Zhang, Frederic Sala. “Just Select Twice: Leveraging Low-Quality Data to Improve Data Selection.”, ATTRIB Workshop at **NeurIPS** 2024; extended version in submission. [\[Paper\]](#) ↗

Research Experience & Project

Bayesian Flow Networks for Robotic Manipulation (Project Lead)

Advisor: Prof. Erdem Biyik, USC

Dec 2025 – present

Los Angeles, CA

- Investigating Bayesian Flow Networks as a generative modeling framework for robotic manipulation, with a focus on uncertainty-aware action generation.
- Designed and implemented simulation experiments in Push-T and RoboMimic, and real-world evaluations on Push-T and object insertion tasks using the WidowX robot.
- Project ongoing; targeting submission to the International Conference on Intelligent Robots and Systems (IROS) 2026.

Contextual Override in VLA Agents: Analysis and Mitigation (Project Lead)

Advisor: Prof. Erdem Biyik, USC

Sep 2025 – present

Los Angeles, CA

- Identified contextual override in VLA agents, where scene affordances dominate language instructions.
- Proposed a conflicting-affordance benchmark and mitigated bias via reward-model fine-tuning (DROID, LIBERO).
- Project ongoing; targeting submission to the International Conference on Intelligent Robots and Systems (IROS) 2026.

Context-Incongruity Robustness for Large Vision Language Models (Project Lead) Advisor: Prof. Hao Su (UC San Diego); Prof. Erdem Bıyık (USC)	Aug 2024 - Sep 2025 San Diego, CA
<ul style="list-style-type: none"> Developed ORIC to generate context-incongruous object-context data for training and evaluation, and built ORIC-Bench via dual LLM and CLIP sampling. Evaluated 18 LVLMs and 2 open-vocabulary detectors; improved Qwen3-VL-8B-Instruct with Visual-RFT on ORIC-style data for stronger human-aligned predictions. Submitted the extended ORIC study to CVPR 2026. 	
Multi-modal Language Model for Drug Interaction Prediction (Project Lead) Advisor: Prof. Pengtao Xie; UC-San Diego	Dec 2024 - May 2025 San Diego, CA
<ul style="list-style-type: none"> Fine-tuned a multi-modal LLM with SMILES inputs to predict drug interaction status, degree, and mechanisms, integrating chemical informatics and NLP. Achieved strong performance: METEOR 0.42, BLEU-1 0.25, semantic similarity 0.57; outperforming GPT-4o (METEOR 0.16, BLEU-1 0.11, semantic similarity 0.30). 	
Empirical Analysis of State-to-Visual (S2V) Imitation vs. Visual RL (Project Co-Lead) Advisor: Prof. Hao Su, UC-San Diego	Feb 2024 - Sep 2024 San Diego, CA
<ul style="list-style-type: none"> Benchmarked State-to-Visual DAgger vs. visual RL across 16 tasks from ManiSkill, DMControl, and Adroit. Analyzed performance trade-offs, efficiency, and computational costs. Built a standardized S2V pipeline and derived practical recommendations. 	
Simulation of the Connected and Automated Driving Systems Advisor: Prof. Bin Ran; The Connected Automated Vehicle Highway System Group	Sep 2021 - May 2022 Madison, WI
<ul style="list-style-type: none"> Simulated and optimized traffic systems in CARLA, enhancing traffic management models for improved efficiency. Refined object detection algorithms, including YOLO and Faster R-CNN, to improve vehicle detection and traffic control systems. 	

Industry Experiences

Computer Vision Algorithm Engineer Mech-Mind Robotics Technologies Ltd.	Jun 2023 - Sep 2023 Beijing, China
<ul style="list-style-type: none"> Developed algorithms for structured light 3D cameras, improving image accuracy and optimizing point cloud reconstruction for laser systems. Led the refinement of internal camera distortion models, significantly enhancing imaging fidelity and calibration precision. 	

Teaching

Teaching Assistant at UW-Madison	Spring 2023
<ul style="list-style-type: none"> CS540: Introduction to Artificial Intelligence 	

Peer Mentor at UW-Madison	Fall 2022
<ul style="list-style-type: none"> CS537: Introduction to Operating System 	

Professional Services

Reviewer	
<ul style="list-style-type: none"> AAAI Conference on Artificial Intelligence 	
<ul style="list-style-type: none"> AAAI Workshop: Large Language Models and Generative AI for Health 	

Technical Skills

- Languages:** English (Proficient; TOEFL 108, GRE 330 + 3.5), Chinese (Native)
- Programming:** Python, C++, C, Java, Matlab, R, LaTeX, SQL
- ML and Vision Frameworks:** PyTorch, TensorFlow, OpenCV, scikit-learn, SimpleITK, SPM12, TorchIO
- Simulation and Robotics:** CARLA, MuJoCo, ManiSkill, DMControl, RoboMimic, WidowX, Adroit.
- Developer Tools:** VS Code, Vim, IntelliJ IDEA, Visual Studio, Git, Docker, Kubernetes