

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 can perceive, reason, and act in the physical world. I work at the intersection of **multimodal learning**, **robot learning**, and **preference learning**. Specifically, I study: **(1)**. improving the robustness of vision–language models under distribution shifts; **(2)**. learning sample-efficient control and planning policies through imitation learning, reinforcement learning, and diffusion-based methods; and **(3)**. aligning robotic behaviors with human goals using feedback and preference data. My long-term goal is to build interpretable, reliable, and safe robots that generalize beyond curated demonstrations.

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.” ICCV 2025 Workshop on Multi-Modal Reasoning for Agent Intelligence (MMRAgI); extended version in submission. [\[Paper\]](#) ↗ [\[Code\]](#) ↗
- 2. **Zhaoyang Li**, Sushaanth Srinivasan, Ninad Ekbote, Pengtao Xie. “A Multi-modal Large Language Model for Predicting Mechanisms of Drug Interactions.” Under review, 2025.
- 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?” 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

Preference Guidance for Diffusion Policy via Energy-Based Model (Led project)

Advisor: Prof. Erdem Biyik, USC

Sep 2025 – present

Los Angeles, CA

- Designed an energy-based preference model to score action trajectories based on human preferences and to shape diffusion policy learning.
- Building an end-to-end pipeline for preference-based robot control across RoboMimic and OpenAI Gym tasks (HalfCheetah, Hopper, Walker2d), PushT, and real-robot evaluation on WidowX.
- Project ongoing; targeting a submission to the International Conference on Intelligent Robots and Systems (IROS) 2026.

Vision-Language Model Benchmarking (Led project)

Advisor: Prof. Hao Su, UC-San Diego

Aug 2024 - Sep 2025

San Diego, CA

- Developed ORIC, a framework that generates context-incongruous object-recognition data for training and evaluation, revealing uncertainty-driven failures in LVLMs.
- Designed dual LLM- and CLIP-guided sampling to construct challenging ORIC-Bench and ORIC-style datasets, and evaluated 18 LVLMs and 2 open-vocabulary detectors under contextual incongruity.
- Fine-tuned Qwen3-VL-8B-Instruct with Visual-RFT on ORIC-style data, improving benchmark performance and aligning predictions with human reasoning.

Multi-modal Language Model for Drug Interaction Prediction (Led project) 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 (Co-leading project) 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. 	
Modality Transfer for PET and MRI Images Advisor: Prof. Vikas Singh; UW-Madison Medical Science Center, Computer Vision Group	May 2022 - Jun 2023 Madison, WI
<ul style="list-style-type: none"> Enhanced image translation with self-attention, MobileNetV2, and total variance loss in the pix2pix framework. Proposed U-TransGan model achieving PSNR 32, 0.98 correlation, and 0.92 SSIM. 	
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. 	
Backend Engineer Quanzhou YouGouZan Network Technology Co., Ltd.	Jun 2020 - Aug 2020 Quanzhou, China
<ul style="list-style-type: none"> Developed an online shopping mall on WeChat using SQL and Java, enabling functionalities like product search, browsing, recommendations, ordering, and payment. 	

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 325 + 3.5), Chinese (Native)
- Programming:** Python, C++, C, Java, Matlab, R, LaTeX, SQL
- ML / Vision Frameworks:** PyTorch, TensorFlow, OpenCV, scikit-learn, SimpleITK, SPM12, TorchIO
- Simulation / Robotics:** CARLA, MuJoCo, ManiSkill, DMControl, RoboMimic, WidowX, Adroit.
- Developer Tools:** VS Code, Vim, IntelliJ IDEA, Visual Studio, Git, Docker, Kubernetes