Zhaoyang Li

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Education

MS **University of California San Diego** Sep 2023 - Jun 2025
- Electrical and Computer Engineering (Intelligent Systems, Robotics & Control)

BS **University of Wisconsin-Madison**, Jan 2021 - May 2023
- **Double Major** in Computer Science & Mathematics

Research Interests

My research focuses on creating an **AI agent** that can interact with the world. Specifically, I am interested in **Vision Language Model**, **Large Language Model**, **Reinforcement learning**, **Imitation Learning**, and **Embodied AI**.

Publications & Preprints

* indicates equal contributions.

- 1. **Zhaoyang Li***, Zhan Ling*, Yuchen Zahou, Hao Su, "ORIC: Benchmarking Object Recognition in Incongruous Context for Large Vision-Language Models", Under Review, 2025
- 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?”, published in Association for the Advancement of Artificial Intelligence (AAAI), 2025
- 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, Attributing Model Behavior at Scale (ATTRIB) Workshop, The Thirty-Eighth Annual Conference on Neural Information Processing Systems (NeurIPS 2024).

Research Experience & Project

Preference Guidance for Diffusion Policy via Energy-Based Model (Led project)
Advisor: Prof. Erdem Bıyık, USC Jul 2025 – present
Los Angeles, CA
- Developed an Energy-Based Model to align action trajectories with human preferences and applied it as exact energy guidance for fine-tuning diffusion policies.
- Preparing a manuscript for submission to *Robotics: Science and Systems (RSS) 2026*.

Multi-modal Language Model for Drug Interaction Prediction (Led project) Dec 2024 - May 2025
Advisor: Prof. Pengtao Xie; UC-San Diego San Diego, CA
- 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).
- Submitted a paper for *Nature Biotechnology*.

Vision-Language Model Benchmarking (Led project) Aug 2024 - Feb 2025
Advisor: Prof. Hao Su, UC-San Diego San Diego, CA
- Developed ORIC, a benchmark for object recognition under incongruous contexts, revealing performance gaps in LVLMs.
- Designed CLIP- and LLM-based sampling to generate challenging test cases.
- Submitting a paper for CVPR 2026

Empirical Analysis of State-to-Visual (S2V) Imitation vs. Visual RL (Co-leading project) Dec 2024 - Jul 2025
Advisor: Prof. Hao Su, UC-San Diego San Diego, CA

- Benchmarked State-to-Visual DAgger vs. visual RL across 16 tasks from ManiSkill, DM-Control, 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 May 2022 - Jun 2023
Advisor: Prof. Vikas Singh; UW–Madison Medical Science Center, Computer Vision Group Madison, WI

- 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.

Wisconsin Science and Computing Emerging Research Stars (WISCERS) Jun 2022 - Aug 2022
Advisor Prof. Chunming Zhang Madison, WI

- Implemented Robust Principal Component Analysis with Complex Noise, applying it to feature analysis of 2D images in computer vision. Explored dimension reduction and optimized PCA algorithms.

Simulation of the Connected and Automated Driving Systems Sep 2021 - May 2022
Advisor: Prof. Bin Ran; The Connected Automated Vehicle Highway System Group Madison, WI

- 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

- 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

- 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

- CS540: Introduction to Artificial Intelligence

Peer Mentor at UW-Madison Fall 2022

- CS537: Introduction to Operating System

Professional Services

Reviewer

- AAAI Conference
- AAAI Workshop: Large Language Models and Generative AI for Health

Technical Skills

- **Language**: English (Proficient, TOEFL:108 GRE:325+3.5), Chinese(Native)
- **Programming Language**: Assembly, C, C++, Java, C#, Python, R, Matlab, Latex, MySql, SQL
- **Frameworks**: Frameworks: OpenCV, Tensorflow, Pytorch, Sklearn, SPM12, SimpleITK, Torchio, Carla
- **Developer Tools**: IntelliJ IDEA, VS Code, Vim, Visual Studio, Jest, Xcode, UE, QT