Zipeng (Leo) Lin

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EDUCATION

University of California, Berkeley <div align="right">Berkeley, CA</div>

Major: Computer Science (EECS Honors), Mathematics. <div align="right">Expected May. 2025</div>

GPA: **3.887/4.0**

Relevant Courses: Real Analysis (A+), Discrete Mathematics (A+), Abstract Algebra, Concepts of Probability, Concepts of Statistics, Optimization Models in Engineering, Machine Learning, Deep Learning, Algorithms, Random Process, Deep Reinforcement Learning (A+), Programming for Mathematical Applications (A+)

PUBLICATIONS

Google Scholar: https://scholar.google.com/citations?user=S1YPXrgAAAAJ

1. Zhai, Yuexiang, **Lin, Zipeng** et al. "Fine-Tuning Large Vision-Language Models as Decision-Making Agents via Reinforcement Learning." arXiv preprint arXiv:2405.10292 (2024). 2024 Conference on Neural Information Processing Systems, accepted.

2. **Lin, Zipeng**, and Zhenguo Nie. "IC classifier: a classifier for 3D industrial components based on geometric prior using GNN." arXiv preprint arXiv:2303.05730 (2023).

3. Luo, Jianlan, Xu, Charles, Liu, Fangchen, Tan, Liam, **Lin, Zipeng** et al. "FMB: A functional manipulation benchmark for generalizable robotic learning." arXiv preprint arXiv:2401.08553 (2024). The International Journal of Robotics Research, accepted.

4. O'Neill, Abby, et al. "Open x-embodiment: Robotic learning datasets and rt-x models." *arXiv preprint arXiv:2310.08864* (2023).

RESEARCH EXPERIENCE

Sample Efficiency Fine-tuning Large Language Model <div align="right">May 2024-Oct.2024</div>

Member, Advisor: Advisor: Prof. Sergey Levine, UC-Berkeley

- Co-led the project as one of two undergraduates focusing on efficient offline data sampling for fine-tuning large language models
- Developed half of the project's infrastructure and algorithm implementation, including per-token Q-learning approaches
- Proposed ideas for Q-value calculation using per-token Q-learning and coded the algorithm with innovative adjustments
- Implemented and improved Reinforcement Learning from Past Data (RLPD) while learning to identify and debug unusual Q-values

Functional Manipulation Benchmark (FMB) <div align="right">Jun.2023-Aug.2023</div>

Undergraduate Research Assistant, Advisor: Prof. Sergey Levine, UC-Berkeley

- Participated in developing a functional manipulation benchmark using 3D printed objects to study robotic learning
- Assisted in data collection for various robotic actions, including fixing, regrasping, rotating, and moving printed blocks
- Contributed to facilitating the data collection pipeline to enhance efficiency in gathering diverse types of manipulation data
- Supported the creation of an imitation learning system that provides basic policies for each skill in the robotic manipulation tasks

Geometric-attention Aware Classification of Industrial Components <div align="right">Dec.2021-Sep.2022</div>

Member, Advisor: Prof. Zhenguo Nie, Tsinghua University

- Designed and implemented a novel algorithm combining graph neural networks and attention mechanisms for classifying mechanical components
- Conducted comprehensive literature research to inform the development of a framework that captures both local geometric details and global structures
- Coded the entire algorithm independently while incorporating feedback from the advising professor to iteratively improve its performance

- Created visualizations to debug the model and demonstrate the effectiveness of the algorithm

Fine-Tuning Large Vision-Language Models as Decision-Making Agents via Reinforcement Learning

Member, Advisor: Prof. Sergey Levine, UC-Berkeley Nov.2023-May 2024

- Developed solvers and data collection scripts for multiple environments to create datasets for fine-tuning large language models
- Implemented and adapted the reinforcement learning algorithm to new environments with different architectures and settings
- Coded the model and baseline for a novel environment incorporating Proximal Policy Optimization techniques
- Contributed to debugging processes by creating simplified tasks and identifying core component issues in language model performance

Autonomous Driving Project with Wayve.ai Mar.2023-Oct.2023

Undergraduate Research Assistant, Advisor: Prof. Sergey Levine, UC-Berkeley

- Contributed to an innovative offline reinforcement learning project using large-scale visual data for autonomous driving at Wayve.ai
- Debugged and improved the data pipeline to enhance algorithm speed for processing driving image data
- Developed a visualization tool using Carla to simulate model performance in real-world driving scenarios
- Assisted in transitioning from behavior cloning to implicit Q-learning by coding a version that bridged the two approaches

TEACHING EXPERIENCE

Reader for Math 104 (Introduction to Real Analysis) Jan.2022-Dec.2022
Reader for CS 189 (Machine Learning) Jan.2023-Jun.2023
Tutor for CS 182 (Deep Neural Networks) Aug.2023-Dec.2023

SKILLS

Computer Skills: Python, Java, C
Framework: DeepSpeed, Hugging Face, PyTorch, JAX