

# Jesse Zhang

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## RESEARCH INTERESTS

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I'm a 4th-year PhD candidate interested in deep reinforcement learning (RL) and robotics. I want to enable autonomous, generalist agents via guidance from large pre-trained models. My previous work spans hierarchical, offline, model-based, and skill-based RL, robotic platforms, and program synthesis.

## EDUCATION

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<b>University of Southern California</b> , Los Angeles, CA <i>Ph.D.</i> in Computer Science (Advisors: Erdem Biyik, Joseph Lim, Jesse Thomason)	2020 - Present GPA: 4.00/4.00
<b>UC Berkeley</b> , Berkeley, CA <i>B.A.</i> in Computer Science (Highest Distinction)	2016 - 2020 GPA: 3.96/4.00

## IN SUBMISSION

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- [S1] Yufei Wang, Zhanyi Sun, **Jesse Zhang**, Zhou Xian, Erdem Biyik, David Held, and Zackory Erickson. "RL-VLM-F: Reinforcement Learning from Vision Language Foundation Model Feedback", *In submission to ICML 2024*, 2024

## CONFERENCE PAPERS

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- [C10] **Jesse Zhang**, Karl Pertsch, Jiahui Zhang, and Joseph J Lim. "SPRINT: Scalable Semantic Policy Pre-training via Language Instruction Relabeling", *ICRA 2024. Spotlight at LangRob Workshop at CoRL 2022*,
- [C9] Zuxin Liu, **Jesse Zhang**, Kavosh Asadi, Yao Liu, Ding Zhao, Shoham Sabach, and Rasool Fakoor. "TAIL: Task-Specific Adapters for Imitation Learning", *ICLR*, 2024
- [C8] Sumedh Anand Sontakke, **Jesse Zhang**, Séb Arnold, Karl Pertsch, Erdem Biyik, Dorsa Sadigh, Chelsea Finn, and Laurent Itti. "RoboCLIP: One Demonstration is Enough to Learn Robot Policies", *NeurIPS*, 2023
- [C7] **Jesse Zhang**, Jiahui Zhang, Karl Pertsch, Ziyi Liu, Xiang Ren, Minsuk Chang, Shao-Hua Sun, and Joseph J Lim. "Bootstrap Your Own Skills: Learning to Solve New Tasks with Large Language Model Guidance", *Oral at CoRL 2023 (top 6.6%). Spotlight at Articulate Robots Workshop at RSS 2023*, 2023
- [C6] Dweep Trivedi\*, **Jesse Zhang**\*, Shao-Hua Sun, and Joseph J. Lim. "Learning to Synthesize Programs as Interpretable and Generalizable Policies", *NeurIPS*, 2021
- [C5] **Jesse Zhang**\*, Haonan Yu\*, and Wei Xu. "Hierarchical Reinforcement Learning by Discovering Intrinsic Options", *ICLR*, 2021
- [C4] Avi Singh, Albert Yu, Jonathan Yang, **Jesse Zhang**, Aviral Kumar, and Sergey Levine. "COG: Connecting New Skills to Past Experience with Offline Reinforcement Learning", *CoRL*, 2020
- [C3] **Jesse Zhang**, Brian Cheung, Chelsea Finn, Sergey Levine, and Dinesh Jayaraman. "Cautious Adaptation For Reinforcement Learning in Safety-Critical Settings", *ICML*, 2020
- [C2] **Jesse Zhang**, Jack Sullivan, Vasudev Venkatesh PB, Kyle Tse, Andy Yan, John Leyden, Kalyanaraman Shankari, and Randy H Katz. "TripAware: Emotional and Informational Approaches to Encourage Sustainable Transportation via Mobile Applications", *Proceedings of the 6th ACM International Conference on Systems for Energy-Efficient Buildings, Cities, and Transportation*, 2019

- [C1] Brian Yang, **Jesse Zhang**, Vitchyr Pong, Sergey Levine, and Dinesh Jayaraman. “REPLAB: A Reproducible Low-Cost Arm Benchmark for Robotic Learning”, *ICRA*, 2019

## JOURNAL PAPERS

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- [J1] **Zhang, Jesse**, Jiangyi Xia, Xin Liu, and John Olichney. “Machine Learning on Visibility Graph Features Discriminates the Cognitive Event-Related Potentials of Patients with Early Alzheimer’s Disease from Healthy Aging”, *Brain Sciences*, 2023

## PREPRINTS AND WORKSHOP PAPERS

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- [P5] Taewook Nam, Juyong Lee, **Jesse Zhang**, Sung Ju Hwang, Joseph J Lim, and Karl Pertsch. “LiFT: Unsupervised Reinforcement Learning with Foundation Models as Teachers”, *2nd Workshop on Agent Learning in Open-Endedness (ALOE) at NeurIPS 2023*, 2023
- [P4] Linghan Zhong, Ryan Lindeborg, **Jesse Zhang**, Joseph J Lim, and Shao-Hua Sun. “Hierarchical Neural Program Synthesis”, *ArXiv Preprint*, 2023
- [P3] **Jesse Zhang\***, Karl Pertsch\*, Jiefan Yang, and Joseph J Lim. “Minimum Description Length Skills for Accelerated Reinforcement Learning”, *ICLR 2021 Self-Supervision for Reinforcement Learning Workshop*, 2021
- [P2] Kalyanaraman Shankari, Jonathan Fuerst, Mauricio Fadel Argerich, Eleftherios Avramidis, and **Jesse Zhang**. “MobilityNet: Towards A Public Dataset For Multi-Modal Mobility Research”, *ICLR Climate Change AI Workshop 2020*, 2020
- [P1] Daiyaan Arfeen\* and **Jesse Zhang\***. “Unsupervised Projection Networks for Generative Adversarial Networks”, *ICCV 2019 Sensing, Understanding, and Synthesizing Humans Workshop*, 2019

## HONORS AND AWARDS

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- Best Paper Runner-up, CoRL LangRob Workshop 2022
- Highlighted Reviewer Award (top 8%), ICLR 2022
- Distinguished Reviewer Award (top 8%), NeurIPS 2021
- Travel Award, ICLR 2020
- Honors in Computer Science, UC Berkeley 2020

## EXPERIENCE

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- Applied Scientist Intern* June - November 2023  
Amazon Lablets, Santa Clara, CA  
- Project on automatic robot primitives extraction through skill alignment with large, pre-trained models (Mentors: Rasool Fakoore and Yao Liu)
- Research Intern* February - August 2021  
NAVER CLOVA AI Research, Seongnam, Korea  
- Research in robot learning, human-robot interaction, and large language models (Mentor: Minsuk Chang)
- Research Intern* January - August 2020  
Horizon Robotics, Cupertino, CA  
- Research in hierarchical RL + unsupervised skill discovery (Mentors: Wei Xu and Haonan Yu)
- Undergraduate Researcher* January 2019 - August 2020  
BAIR: Berkeley Artificial Intelligence Research, Berkeley, CA

- Research in robot learning, model-based RL, offline RL (Advised by Sergey Levine + Dinesh Jayaraman)

*Undergraduate Researcher*

May 2018 - August 2018

UC Davis Center for Mind and Brain, Davis, CA

- Research in graph theory and machine learning for dementia classification (Advised by John Olichney)

## SERVICES

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### Reviewer

- CHI 2024, RA-L, ICRA 2024, NeurIPS 2021-2023, ICML 2022-2024, ICLR 2021-2024, CoRL 2021-2023, TMLR, IEEE ITSC 2019

### Mentoring and Outreach

- Google AI Community Project: Mentoring undergrads underrepresented in computer science in design of AI education outreach programs for local K-12 schools. <https://sites.google.com/usc.edu/aicomunityproject>.

## TEACHING

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*Graduate Student Instructor, USC* Spring 2023  
CSCI-566 Deep Learning (Jesse Thomason)

- Held office hours and mentored project teams, integrated Gradescope for grading assignments.

*Graduate Student Instructor, USC* Spring 2022  
CSCI-360 Intro to AI (Bistra Dilkina)

- Held discussion sections, office hours, created homework assignments, wrote exam questions.

*Graduate Student Instructor, USC* Fall 2020  
CSCI-566 Deep Learning and its Applications (Joseph J. Lim)

- Gave 2 lectures, prepared assignments/exams, held office hours, and mentored 6 final project teams

*Undergraduate Student Instructor, UC Berkeley* Fall 2019  
CS 188: Intro to AI (Anca Dragan)

- Lead a discussion section and held office hours — received 4.75/5.00 rating, 0.42 above dept avg

*Course Reader, UC Berkeley* Spring 2019  
CS 170: Algorithms/Intro to CS Theory (Lucas Trevisan and Prasad Raghavendra)

- Held office hours + volunteered to write problems for and help run extra sections on difficult material.

## MENTORING

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### USC Masters Students

- Jiahui Zhang CoRL 2023

### USC Undergraduate Students

- Jiefan Yang 2020-2021

### USC Visiting Scholars

- Sarthak Bhagat 2020-2021
- Dweep Trivedi NeurIPS 2021

## INVITED TALKS

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### **“Robotics in the Context of Large Pre-Trained Models”**

- Perception, Action, and Learning Group at UPenn

February 2024

### **“Learning to Synthesize Programs as Interpretable and Generalizable Policies”**

- AIPlans Workshop at NeurIPS 2021

December 2021

## SELECTED PRESS COVERAGE

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- [P1] “REPLAB: A low-cost benchmark platform for robotic learning,” by Ingrid Fadelli, *Tech Xplore*, May 29, 2019.

Last Update : February 22, 2024