Jesse Zhang

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Research Interests

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

University of Southern California, Los Angeles, CA — 2020 - Present
Ph.D. in Computer Science (Advisors: Erdem Biyik, Joseph Lim, Jesse Thomason) — GPA: 4.00/4.00

UC Berkeley, Berkeley, CA — 2016 - 2020
B.A. in Computer Science (Highest Distinction) — GPA: 3.96/4.00

Conference Papers

[C11] 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", *ICML*, 2024

[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

[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

[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

- Qualcomm Innovation Fellowship Finalist 2024
- 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

Invited Talks

"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

Experience

Research Scientist Intern May - Aug 2024
NVIDIA Seattle Robotics Lab, Seattle, WA
- Will be working on efficient robot adaptation guided by large pre-trained models

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 Fakoor 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

Reviewer

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

Mentoring and Outreach

- Google x USC AI Community Project: Mentoring undergrads in computer science in designing AI education outreach programs for underrepresented students in K-12 schools and Los Angeles community events. `https://sites.google.com/usc.edu/aicommunityproject`.

Teaching

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

USC Masters Students

- Yusen Luo Current

- Athang Gupte — Current
- Jiahui Zhang — CoRL 2023, ICRA 2024, Current

USC Undergraduate Students

- Kevin Kim — Current
- Jiefan Yang — 2020-2021

USC Visiting Scholars

- Sarthak Bhagat — 2020-2021
- Dweep Trivedi — NeurIPS 2021

Selected Press Coverage

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

Last Update : June 23, 2024