

Ruijie Zheng

University of Maryland, College Park

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RESEARCH INTEREST

- Foundational model for embodied agent (large scale multitask offline pretraining)
- (Multimodal) large language model powered agent
- Representation learning for sequential decision making

EDUCATION

University of Maryland College Park

Ph.D. in Computer Science; Advisors: Furong Huang, Hal Daumé III

2022 - present

B.S. in Computer Science, Departmental High Honors

2018 - 2022

B.S. in Mathematics, Departmental High Honors

2018 - 2022

EXPERIENCE

Research Intern

Microsoft Research AI Frontiers, Redmond

Projects: LLM/VLM-powered agent that learns from rich environment feedbacks.

Mentors: Ching-An Cheng, Adith Swaminathan

June 2024 - present

Research Intern

Microsoft Research, Redmond

Projects: Temporal action abstraction in multitask offline pretraining

Mentors: Andrey Kolobov, Ching-An Cheng

June 2023 - August 2023

Research Assistant

University of Maryland, College Park

Advisors: Furong Huang, Hal Daumé III

2020 - present

PUBLICATION

1. PRISE: Learning Multi-task Action Abstraction as a Sequence Prediction Problem

Ruijie Zheng, Ching-An Cheng, Hal Daumé III, Furong Huang, Andrey Kolobov.

In *International Conference on Machine Learning (ICML)*, 2024 (**Oral Presentation (1.5%)**), and **Spotlight Talk** at 2nd Pre-Training for Robot Learning Workshop (PRL) at CoRL 2023

2. Premier-TACO is a Few-Shot Policy Learner: Pretraining Multitask Representation via Temporal Action-Driven Contrastive Loss

Ruijie Zheng, Yongyuan Liang, Xiyao Wang, Shuang Ma, Hal Daumé III, Huazhe Xu, John Langford, Praveen Palanisamy, Kalyan Shankar Basu, Furong Huang.

In *International Conference on Machine Learning (ICML)*, 2024.

3. ACE: Off-Policy Actor-Critic with Causality-Aware Entropy Regularization

Tianying Ji, Yongyuan Liang, Yan Zeng, Yu Luo, Guowei Xu, Jiawei Guo, Ruijie Zheng, Furong Huang, Fuchun Sun, Huazhe Xu

In *International Conference on Machine Learning (ICML)*, 2024 (**Oral Presentation (1.5%)**).

4. Adapting Static Fairness to Sequential Decision-Making: Bias Mitigation Strategies towards Equal Long-term Benefit Rate

Yuan Cheng Xu, Chenghao Deng, Yanchao Sun, Ruijie Zheng, Xiyao Wang, Jieyu Zhao, Furong Huang

In *International Conference on Machine Learning (ICML)*, 2024.

5. DrM: Mastering Visual Reinforcement Learning through Dormant Ratio Minimization

Guowei Xu*, Ruijie Zheng*, Yongyuan Liang*, Xiyao Wang, Zhecheng Yuan, Tianying Ji, Yu Luo, Xiaoyu Liu, Jiaxin Yuan, Pu Hua, Shuzhen Li, Yanjie Ze, Hal Daumé III, Furong Huang, Huazhe Xu.

In *International Conference on Learning Representations (ICLR)*, 2024 (**Spotlight Presentation (5%)**).

6. COPlanner: Plan to Roll Out Conservatively but to Explore Optimistically for Model-Based RL

Xiyao Wang, Ruijie Zheng, Yanchao Sun, Ruonan Jia, Wichayaporn Wongkamjan, Huazhe Xu, Furong Huang.

In *International Conference on Learning Representations (ICLR)*, 2024.

7. Game-Theoretic Robust Reinforcement Learning Handles Temporally-Coupled Perturbations

Yongyuan Liang, Yanchao Sun, Ruijie Zheng, Xiangyu Liu, Benjamin Eysenbach, Tuomas Sandholm,

Furong Huang, Stephen Marcus McAleer.

In *International Conference on Learning Representations (ICLR)*, 2024.

8. **TAC0: Temporal Latent Action-Driven Contrastive Loss for Visual Reinforcement Learning**
Ruijie Zheng, Xiyao Wang, Yanchao Sun, Shuang Ma, Jieyu Zhao, Huazhe Xu, Hal Daumé III, Furong Huang.
In *Neural Information Processing Systems (NeurIPS)*, 2023.
9. **Is Model Ensemble Necessary? Model-based RL via a Single Model with Lipschitz Regularized Value Function.**
Ruijie Zheng*, Xiyao Wang*, Huazhe Xu, Furong Huang.
In *International Conference on Learning Representations (ICLR)*, 2023, and **Spotlight Presentation** in Deep RL Workshop at NeurIPS 2022.
10. **Certiably Robust Policy Learning against Adversarial Communication in Multi-agent Systems**
Yanchao Sun, **Ruijie Zheng**, Parisa Hassanzadeh, Yongyuan Liang, Soheil Feizi, Sumitra Ganesh, Furong Huang.
In *International Conference on Learning Representations (ICLR)*, 2022.
11. **Is Imitation All You Need? Generalized Decision-Making with Dual-Phase Training**
Yao Wei, Yanchao Sun, **Ruijie Zheng**, Sai Vemprala, Rogerio Bonatti, Shuhang Chen, Ratnesh Madaan, Zhongjie Ba, Ashish Kapoor, Shuang Ma.
In *International Conference on Computer Vision (ICCV)*, 2023.
12. **Who Is the Strongest Enemy? Towards Optimal and Efficient Evasion Attacks in Deep RL.**
Yanchao Sun, **Ruijie Zheng**, Yongyuan Liang, Furong Huang.
In *International Conference on Learning Representations (ICLR)*, 2022.
Best Paper Award at NeurIPS 2021 Workshop on Safe and Robust Control of Uncertain Systems
13. **Transfer RL across Observation Feature Spaces via Model-Based Regularization.**
Yanchao Sun, **Ruijie Zheng**, Xiyao Wang, Andrew E Cohen, Furong Huang.
In *International Conference on Learning Representations (ICLR)*, 2022.
14. **Efficiently Improving the Robustness of RL Agents against Strongest Adversaries.**
Yongyuan Liang, Yanchao Sun, **Ruijie Zheng**, Furong Huang.
In *Neural Information Processing Systems (NeurIPS)*, 2022.

HONORS AND AWARDS

- **Best Paper Award** at NeurIPS 2021 Workshop on Safe and Robust Control of Uncertain Systems
- **Dean's Fellowship** (UMD Computer Science Department)
- **Milton Abramowitz Award** (UMD Mathematics Department)
- **Christopher David Malter Memorial Scholarship** (UMD Computer Science Department)
- **Daniel Sweet Undergraduate Research Fellowship** (UMD Mathematics Department)
- **John D. Gannon Scholarship** (UMD Computer Science Department)

SERVICES

Conference Reviewer: NeurIPS 2023,2024, ICML 2023, 2024, ICLR 2024

Workshop Program Committee: Foundational Model for Decision Making (FMDM) Workshop at NeurIPS 2023