

Qi Zhang

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Positions

University of South Carolina, Columbia, SC Aug 2020 - Present
Assistant Professor, Computer Science and Engineering
Faculty, Artificial Intelligence Institute

Education

PhD - Computer Science and Engineering, University of Michigan, Ann Arbor 2015 - 2020
BEng - Electrical Engineering, Shanghai Jiao Tong University, Shanghai, China 2011 - 2015

Research Interests

Artificial Intelligence, Reinforcement Learning, Multi-Agent Systems

Selected Awards

Faculty Early Career Development Program (CAREER) Award, NSF, 2023
David J. Kuck Dissertation Prize, University of Michigan, 2021
Nominated by University of Michigan for the ACM Dissertation Award, 2020

Grants

1. NSF IIS-2425005, “Collaborative Research: RI: Small: Adapting Foundation Models for Multimodal Sequential Decision Making: New Focuses, Formalisms, and Methods”, \$580K (50% share), January 2025 – December 2027 (Lead PI, Co-PI: Yinglun Zhu)
2. NSF IIS-2237963, “CAREER: Identifying and Exploiting Multi-Agent Symmetries”, \$535K, May 2023 – April 2028 (Sole PI)
3. NSF IIS-2154904, “RI: Small: Cooperative Planning and Learning via Scalable and Learnable Multi-Agent Commitments”, \$332K, July 2022 – June 2025 (Sole PI)
4. NSF CNS-2213731, Lead PI, “CCRI: Planning-C: Planning to Build Digital Infrastructure for Real-Time, Continual, and Intelligent Transportation Analysis and Management”, \$93K, Oct 2022 – Mar 2024 (Lead PI, Co-PI: Yuche Chen)
5. University of South Carolina’s ASPIRE, “Meta-Learning Multi-Agent Communication”, \$15K, July 2021 – September 2022 (Sole PI)
6. Google Research’s exploreCSR, “Benedict College – University of South Carolina Collaborative Program to Promote Undergraduate Computing Research”, \$18K, September 2022 – August 2023 (Co-PI, Lead PI: Jiang Hong)

Publications

(* denotes my advisee)

Journal Articles

- J1. Qi Zhang, Edmund H. Durfee, Satinder Singh. “Risk-Aware Analysis for Interpretations of Probabilistic Achievement and Maintenance Commitments.” *Artificial Intelligence* 317 (2023): 103864.

- J2. Qi Zhang, Edmund H. Durfee, Satinder Singh. “Semantics and Algorithms for Trustworthy Commitment Achievement under Model Uncertainty.” *Autonomous Agents and Multi-agent Systems*, 34(1), 19.
- J3. Yutian Wen, Jinyu Shi, Qi Zhang, Xiaohua Tian, Zhengyong Huang, Hui Yu, Yu Cheng, Xuemin (Sherman) Shen. “Quality-Driven Auction based Incentive Mechanism for Mobile Crowd Sensing.” *IEEE Transactions on Vehicular Technology*, 64(9), 4203-4214, 2015.

Conference Proceedings

- C1. Jinzhu Luo*, Dingyang Chen*, Qi Zhang. “Reinforcement Learning with Euclidean Data Augmentation for State-Based Continuous Control.” *The 38th Annual Conference on Neural Information Processing Systems (NeurIPS 2024)*.
- C2. Dingyang Chen*, Qi Zhang, Yinglun Zhu. “Efficient Sequential Decision Making with Large Language Models.” *The 2024 Conference on Empirical Methods in Natural Language Processing (EMNLP 2024)*.
- C3. Dingyang Chen*, Qi Zhang. “E(3)-Equivariant Actor-Critic Methods for Cooperative Multi-Agent Reinforcement Learning.” *The 41st International Conference on Machine Learning (ICML 2024)*.
- C4. Dingyang Chen*, Qi Zhang. “Context-Aware Bayesian Network Actor-Critic Methods for Cooperative Multi-Agent Reinforcement Learning.” *The 40th International Conference on Machine Learning (ICML 2023)*.
- C5. Yuxiang Sun, Qi Zhang “Ensemble Policy Distillation with Reduced Data Distribution Mismatch.” *The 2022 International Joint Conference on Neural Networks (IJCNN 2022)*.
- C6. Dingyang Chen*, Yile Li*, Qi Zhang. “Communication-Efficient Actor-Critic Methods for Homogeneous Markov Games.” *The Tenth International Conference on Learning Representations (ICLR 2022)*.
- C7. Kaushik Roy, Qi Zhang, Manas Gaur, Amit Sheth. “Knowledge Infused Policy Gradients with Upper Confidence Bound for Relational Bandits.” *European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases (ECML PKDD) 2021*.
- C8. Qi Zhang, Edmund H. Durfee, Satinder Singh. “Efficient Querying for Cooperative Probabilistic Commitments.” *The 35th AAAI Conference on Artificial Intelligence (AAAI 2021)*.
- C9. Qi Zhang, Edmund H. Durfee, Satinder Singh. “Modeling Probabilistic Commitments for Maintenance Is Inherently Harder than for Achievement.” *The 34th AAAI Conference on Artificial Intelligence (AAAI 2020)*.
- C10. Qi Zhang, Richard Lewis, Satinder Singh, Edmund H. Durfee. “Learning to Communicate and Solve Visual Blocks-World Tasks.” *The 33rd AAAI Conference on Artificial Intelligence (AAAI 2019)*.
- C11. Qi Zhang, Satinder Singh, Edmund H. Durfee “Minimizing Maximum Regret in Commitment Constrained Sequential Decision Making.” *The 27th International Conference on Automated Planning and Scheduling (ICAPS 2017)*.
- C12. Qi Zhang, Edmund H. Durfee, Satinder Singh, Anna Chen, Stefan Witwicki. “Commitment Semantics for Sequential Decision Making Under Reward Uncertainty.” *In 25th International Joint Conference on Artificial Intelligence (IJCAI 2016)*.
- C13. Qi Zhang, Yutian Wen, Xiaohua Tian, Xiaoying Gan, Xinbing Wang. “Incentivize Crowd Labeling under Budget Constraint.” *In 2015 IEEE Conference on Computer Communications (INFOCOM 2015)*.

Refereed Workshop Proceedings

- W1. Dingyang Chen*, Zhenyu Zhang, Xiaolong Kuang, Xinyang Shen, Ozalp Ozer, and Qi Zhang. “Convergence Rates of Bayesian Network Policy Gradient for Cooperative Multi-Agent Reinforcement Learning.” Workshop on Bayesian Decision-making and Uncertainty at NeurIPS 2024.
- W2. Jianhai Su*, Qi Zhang. “Subgoal Proposition Using a Vision-Language Model.” Workshop on Language and Robot Learning: Language as Grounding at CoRL 2023.
- W3. Jinzhu Luo*, Qi Zhang. “Exploiting MDP Symmetries for Offline Reinforcement Learning.” Workshop on Learning Effective Abstractions for Planning at CoRL 2023.
- W4. Nishtha Mahajan*, Qi Zhang. “Intent-Aware Autonomous Driving: A Case Study on Highway Merging Scenarios.” The Multi-Agent Dynamic Games Workshop at IROS 2023.
- W5. Kaushik Roy, Yuxin Zi, Manas Gaur, Jinendra Malekar, Qi Zhang, Vignesh Narayanan, Amit Sheth. “Process Knowledge-infused Learning for Clinician-friendly Explanations.” AAAI Second Symposium on Human Partnership with Medical Artificial Intelligence, AAAI 2023 Summer Symposium Series.
- W6. Dingyang Chen*, Qi Zhang, Think T. Doan. “Convergence and Price of Anarchy Guarantees of the Softmax Policy Gradient in Markov Potential Games.” Decision Awareness in Reinforcement Learning Workshop at ICML 2022.
- W7. Qi Zhang, Dingyang Chen*. “A Meta-Gradient Approach to Learning Cooperative Multi-Agent Communication Topology.” Workshop on Meta-Learning at NeurIPS 2021.
- W8. Kaushik Roy, Qi Zhang, Manas Gaur, Amit Sheth. “Knowledge Infused Policy Gradients for Adaptive Pandemic Control.” AAAI-MAKE at AAAI Spring Symposium 2021.
- W9. Qi Zhang, Edmund H. Durfee, Satinder Singh. “Challenges in the Trustworthy Pursuit of Maintenance Commitments under Uncertainty.” The 20th International Trust Workshop at AAMAS 2018.

Teaching Experience

University of South Carolina

CSCE 580: Artificial Intelligence [Fall 2020, Fall 2021]
 CSCE 790/775: Reinforcement Learning [Spring 2021, Spring 2022, Spring 2023]
 CSCE 240: Advanced Programming Techniques [Fall 2022, Fall 2023, Fall 2024]
 CSCE 590: Optimization [Spring 2025]

Professional Service

Organizer

The Deep Reinforcement Learning Workshop at NeurIPS 2022
 NSF Workshop on Data-Driven Approaches to Transportation: Bridging Research and Practice, 2023
 BC-USC exploreCSR Program to Promote Undergraduate Computing Research, 2022-2023

NSF Panelist

NSF Graduate Research Fellowships Program (GRFP)NSF
 NSF CISE Core Small Panel in Robust Intelligence

Conference Reviewer/Program Committee

The International Conference on Learning Representations (ICLR)
 The Deep Reinforcement Learning Workshop at NeurIPS 2019, 2020
 Advances in Neural Information Processing Systems (NeurIPS)
 The International Conference on Machine Learning (ICML)
 The AAAI Conference on Artificial Intelligence (AAAI)

IEEE World Congress on Computational Intelligence (WCCI)
The International Joint Conference on Artificial Intelligence (IJCAI)

Journal Reviewer

IEEE Internet Computing

ACM Transactions on Intelligent Systems and Technology (TIST)