

JIAYU CHEN

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PROFESSIONAL EXPERIENCE

Carnegie Mellon University, Pittsburgh, Pennsylvania, U.S.A May 2024 – May 2025
Postdoctoral Fellow in School of Computer Science

EDUCATION BACKGROUND

Purdue University, West Lafayette, Indiana, U.S.A 2020 – 2024
Ph.D. in Industrial Engineering and Operations Research

Peking University, Beijing, China 2016 – 2020
B.E. from College of Engineering, Minor in Computer Science

RESEARCH AREAS

Reinforcement Learning, Sequential Decision Making, Optimal Control

CONFERENCE PUBLICATIONS

1. **Jiayu Chen**, Wentse Chen, and Jeff Schneider, “Bayes Adaptive Monte Carlo Tree Search for Offline Model-based Reinforcement Learning”, submitted to ICLR 2025.
2. **Jiayu Chen**, Bhargav Ganguly, Tian Lan, and Vaneet Aggarwal, “Variational Offline Multi-agent Skill Discovery”, submitted to AAAI 2025.
3. Wenyan Xu, **Jiayu Chen**, Chen Li, Yonghong Hu, and Zhonghua Lu, “Mining Intraday Risk Factor Collections via Hierarchical Reinforcement Learning based on Transferred Options”, submitted to SDM 2025.
4. **Jiayu Chen**, Vaneet Aggarwal, and Tian Lan, “A Unified Algorithm Framework for Unsupervised Discovery of Skills based on Determinantal Point Process”, accepted in Proc. NeurIPS, Dec 2023.
5. **Jiayu Chen**, Dipesh Tamboli, Tian Lan, and Vaneet Aggarwal, “Multi-task Hierarchical Adversarial Inverse Reinforcement Learning”, accepted in Proc. ICML, Jul 2023.
6. **Jiayu Chen**, Tian Lan, and Vaneet Aggarwal, “Option-Aware Adversarial Inverse Reinforcement Learning for Robotic Control”, accepted in Proc. IEEE ICRA, Jun 2023.
7. **Jiayu Chen**, Jingdi Chen, Tian Lan, and Vaneet Aggarwal, “Scalable Multi-agent Covering Option Discovery based on Kronecker Graphs”, accepted in Proc. NeurIPS, Dec 2022.
8. **Jiayu Chen**, Marina Wagdy Wadea Haliem, Tian Lan, and Vaneet Aggarwal, “Multi-agent Deep Covering Option Discovery”, accepted in Proc. ICML Reinforcement Learning for Real Life Workshop, Jul 2021.
9. **Jiayu Chen**, Abhishek K. Umrawal, Tian Lan, and Vaneet Aggarwal, “DeepFreight: A Model-free Deep-reinforcement-learning-based Algorithm for Multi-transfer Freight Delivery”, accepted in Proc. ICAPS, Aug 2021.
10. Pin Wang, Dapeng Liu, **Jiayu Chen**, Hanhan Li, and Ching-Yao Chan, “Decision Making for Autonomous Driving via Augmented Adversarial Inverse Reinforcement Learning”, accepted in Proc. IEEE ICRA, Jun 2021.
11. Jilin Mei, **Jiayu Chen**, Wen Yao, Xijun Zhao, and Huijing Zhao, “Supervised Learning for Semantic Segmentation of 3D LiDAR Data”, accepted in Proc. IEEE IV, Jun 2019.

JOURNAL PUBLICATIONS

1. Swetha Ganesh, **Jiayu Chen**, Gugan Thoppe, and Vaneet Aggarwal, “Global Convergence Guarantees for Federated Policy Gradient Methods with Adversaries”, submitted to TMLR.
2. Bhargav Ganguly, Abhimanyu Shekhar, Chang-Lin Chen, **Jiayu Chen**, Vaneet Aggarwal, Shweta Singh, “A Deep Reinforcement Learning Approach for Circular Economy Management”, submitted to Nature Sustainability.
3. **Jiayu Chen**, Tian Lan, and Vaneet Aggarwal, “Hierarchical Deep Counterfactual Regret Minimization”, submitted to JMLR.
4. Chang-Lin Chen, Hanhan Zhou, **Jiayu Chen**, Mohammad Pedramfar, Vaneet Aggarwal, Tian Lan, Zheqing (Bill) Zhu, Chi Zhou, Pol Mauri Ruiz, Neeraj Kumar, Hongbo Dong, “Learning-based Two-tiered Online Optimization of Region-wide Datacenter Resource Allocation”, submitted to IEEE Transactions on Network and Service Management (TNSM).
5. **Jiayu Chen**, Bhargav Ganguly, Yang Xu, Yongsheng Mei, Tian Lan, and Vaneet Aggarwal, “Deep Generative Models for Offline Policy Learning: Tutorial, Survey, and Perspectives on Future Directions”, accepted in TMLR (with a **Survey Certification**).
6. Dipesh Tamboli, **Jiayu Chen**, Kiran Pranesh Jotheeswaran, Denny Yu, Vaneet Aggarwal, “Reinforced Sequential Decision-Making for Sepsis Treatment: The PosNegDM Framework with Mortality Classifier and Transformer”, accepted in IEEE Journal of Biomedical and Health Informatics, Mar 2024.
7. **Jiayu Chen**, Vaneet Aggarwal, and Tian Lan, “Hierarchical Adversarial Inverse Reinforcement Learning”, accepted in IEEE Transactions on Neural Networks and Learning Systems (TNNLS), Aug 2023.
8. **Jiayu Chen**, Jingdi Chen, Tian Lan, and Vaneet Aggarwal, “Learning Multi-agent Options for Tabular Reinforcement Learning using Factor Graphs”, accepted to IEEE Transactions on Artificial Intelligence (TAI), Jul 2022.

TEACHING EXPERIENCE

School of IE, Purdue University, West Lafayette, Indiana, U.S.A 2021 Fall – 2024 Spring
Teaching Assistant IE 23000 - Probability And Statistics, IE 53800 - Nonlinear Optimization

RESEARCH EXPERIENCE

School of CS, Carnegie Mellon University, Pittsburgh, Pennsylvania, U.S.A 05/2024 – 05/2025
Postdoctoral Fellow **Instructor: Prof. Jeff Schneider**

My research primarily explores the application of reinforcement learning and deep search in plasma control. This collaborative endeavor involves Princeton University, Princeton Plasma Physics Laboratory, and General Atomics, and focuses on advancing controllable nuclear fusion. The project is supported by a grant from the United States Department of Energy. The specific research topics are as follows:

- Modeling the dynamics of plasma within the Tokamak device, specifically DIII-D, by supervised learning;
- Quantifying the uncertainty of dynamic predictions using deep ensemble methods.
- Developing control policies based on Bayes-adaptive RL and Monte Carlo Tree Search.
- Enhancing the generalization and robustness of offline model-based RL via causal discovery.

School of IE, Purdue University, West Lafayette, Indiana, U.S.A 07/2020 – 05/2024
Research Assistant **Instructor: Prof. Vaneet Aggarwal, Prof. Tian Lan**

- Reinforcement Learning Algorithm Design:
 - Unsupervised/Multi-agent/Offline Skill Discovery
 - Hierarchical Decision Making
 - Multi-task Hierarchical Imitation Learning
- Reinforcement Learning Applications:

- Developed a scalable and robust scheduling algorithm that integrates Multi-agent Reinforcement Learning and Optimization for multi-transfer freight delivery.
- Developed a large-scale Poker AI based on Multi-agent Reinforcement Learning and Heuristic Search.
- Utilized Offline Reinforcement Learning (specifically Decision Transformer) to optimize healthcare decision-making for sepsis treatment, approaching the level of expert performance.

School of EECS, University of California, Berkeley, California, U.S.A

09/2019 – 01/2020

Research Assistant **Instructor: Prof. Ching-Yao Chan**

- Developed a lane-changing simulator based on SUMO for efficient RL training and evaluation.
- Proposed a novel Meta Imitation Learning algorithm for diverse lane-changing behavior learning of autonomous vehicles.

School of EECS, Peking University, Beijing, China

09/2018 – 07/2020

Research Assistant **Instructor: Prof. Huijing Zhao**

- Explored the optimal composition of data input from various sensor types for semantic segmentation of 3D LiDAR data, crucial for semantic understanding in autonomous driving.
- Worked on semi-supervised learning for semantic segmentation of 3D LiDAR data in dynamic scenes, achieving performance on par with fully supervised algorithms while utilizing just 50% labeled data.
- Constructed a simulator using CARLA to model interactions between autonomous vehicles and pedestrians, emulating crucial decision-making scenarios in autonomous driving, and employed (Inverse) RL techniques for driving behavior learning.

HONORS AND AWARDS

Benz Scholarship, Peking University	Dec 2017
Learning Excellence Award, Peking University	Dec 2017
JJ World Scholarship, Peking University	Dec 2018
Merit Student Award, Peking University	Dec 2018
Peking University Third Prize Scholarship, Peking University	Dec 2019
Merit Student Award, Peking University	Dec 2019
NeurIPS Scholar Award, NeurIPS	Oct 2022, Oct 2023
Oracle for Research Project Award, Oracle	Aug 2023
Graduate School Summer Research Grant, Purdue University	Mar 2024

SERVICE

- Reviewer:
 - ICLR (2024, 2025), NeurIPS (2023, 2024), ICML (2022, 2024), L4DC 2024, AISTATS 2025
 - Scientific Reports, Information Sciences, Engineering Applications of Artificial Intelligence
 - IEEE Transactions on Neural Networks and Learning Systems
 - IEEE Transactions on Artificial Intelligence
 - IEEE Transactions on Games
 - IEEE Transactions on Intelligent Transportation Systems
 - IEEE Transactions on Cybernetics
 - IEEE Transactions on Cognitive and Developmental Systems
 - Transactions on Machine Learning Research
- Program Committee:
 - IEEE International Conference on Data Science and Advance Analytics, 2023
 - AAAI 2025