JIAYU CHEN

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EDUCATION BACKGROUND

Purdue University, West Lafayette, Indiana, U.S.A 2020 – Present (expected May 2024)

Ph.D. candidate in School of Industrial Engineering (Operation Research), GPA: 4.0/4.0

Peking University, Beijing, China 2016 – 2020

B.E. in College of Engineering, GPA: 3.70/4.0

COURSEWORK

- **Undergraduate-level:** Mathematical Analysis, Data Structure and Algorithm, Advanced Algebra, Numerical Analysis, Set Theory and Graph Theory, Intelligent Robots, Algorithms in Game AI, C++ Programming, Java Programming, Database Systems, Computer Architectures.
- **Graduate-level:** Artificial Intelligence, Linear Programming, Probability, Nonlinear Optimization, Mathematics Of Data Science, Stochastic Process, Real Analysis, Convex Optimization, Dynamic Programming, Algorithm Design & Analysis & Implementation, Mathematical Statistics

PUBLICATIONS

1. **Jiayu Chen**, Tian Lan, and Vaneet Aggarwal, "Hierarchical Deep Counterfactual Regret Minimization", submitted to JMLR.
2. 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", submitted to IEEE Journal of Biomedical and Health Informatics.
3. Chang-Lin Chen, Hanhan Zhou, **Jiayu Chen**, Mohammad Pedramfar, Vaneet Aggarwal, Tian Lan, Zheqing (Bill) Zhu, Chi Zhou, Tim Gasser, Pol Mauri Ruiz, Vijay Menon, 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).
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 2023, 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 (presented in person).
6. **Jiayu Chen**, Tian Lan, and Vaneet Aggarwal, "Option-Aware Adversarial Inverse Reinforcement Learning for Robotic Control", accepted in Proc. IEEE ICRA, Jun 2023 (presented in person).
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 (presented in person).
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.
9. **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 (presented online).
10. **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 (presented online).
11. 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.

12. 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.

Teaching Experience

School of IE, Purdue University, West Lafayette, Indiana, U.S.A 2021 Fall – Present

Teaching Assistant IE 23000 - Probability And Statistics, IE 53800 - Nonlinear Optimization

Research Experience

School of IE, Purdue University, West Lafayette, Indiana, U.S.A 07/2020 – Present

Research Assistant Instructor: Prof. Vaneet Aggarwal

- Applied Deep Reinforcement Learning on real-life challenges:
  - Developed a scalable and robust scheduling algorithm that integrates Multi-agent Reinforcement Learning and Non-linear 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.
  - Applied deep reinforcement learning and an optimization solver in conjunction for efficient computing resource allocation. (A collaboration with Meta.)
- Developed algorithms to integrate Temporal Abstractions with Reinforcement Learning for advanced human-like decision-making, including Multi-agent Skill Discovery, Unsupervised Skill Discovery, and (Meta) Hierarchical Imitation Learning algorithms, which are published in top-tier revenues and demonstrated vast potential in fields like robotics and scheduling.

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 of autonomous vehicles based on SUMO for efficient Reinforcement Learning training and evaluation.
- Proposed a novel Meta Imitation Learning algorithm for diverse lane-changing behavior learning of autonomous vehicles, surpassing SOTA baselines.

School of EECS, Peking University, Beijing, China 09/2018 – 07/2020

Research Assistant Instructor: Prof. Huijing Zhao

- Proposed the optimal composition and combination of data input from various sensor types for the semantic segmentation of 3D LiDAR data, crucial for semantic understanding in autonomous driving.
- Implemented 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) Reinforcement Learning techniques to facilitate driving behavior learning.

Skills

- Programming Languages: Python, C++, Java, R, Matlab
- Platform: Linux, Mujoco, CARLA, SUMO
- Framework: Pytorch, Tensorflow, Django, OpenCV

Honors and Awards

Awarded Benz Scholarship, Peking University Dec 2017
Acquired Learning Excellence Award, Peking University Dec 2017

Awarded JJ World Scholarship, Peking University	Dec 2018
Acquired Merit Student Award, Peking University	Dec 2018
Awarded Peking University Third Prize Scholarship, Peking University	Dec 2019
Acquired Merit Student Award, Peking University	Dec 2019
NeurIPS Scholar Award, NeurIPS	Oct 2022
Oracle for Research Project Award, Oracle	Aug 2023

Reviewer

- ICLR 2024, NeurIPS 2023, ICML 2022
- Information Sciences
- 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

Program Committee

- IEEE International Conference on Data Science and Advance Analytics, 2023

Miscellaneous

- **Personal Website:** https://lucascjysdl.github.io/
- GitHub: https://github.com/LucasCJYSDL
- LinkedIn: https://www.linkedin.com/in/jiayu-chen-a707b5198/
- Languages: English - Fluent, Mandarin - Native speaker