

Yang "William" Xu

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RESEARCH INTERESTS

My research interests lies in the joint discipline of theoretical computer science, statistics, and operations research. Specifically, I develop theoretically grounded algorithms for sequential decision-making in stochastic systems. My current work focuses on robust reinforcement learning and planning with finite-sample and convergence-rate guarantees. I also collaborate on deep RL projects. In the future, I aim to build practical, robustness-aware theory for broader classes of stochastic iterative algorithms.

EDUCATION

Purdue University , West Lafayette, USA Ph.D. in Industrial Engineering (Operations Research) <i>Advisor</i> : Prof. Vaneet Aggarwal	Aug 2022 – Present
Purdue University , West Lafayette, USA M.S. in Electrical and Computer Engineering	Aug 2022 – May 2025
The Chinese University of Hong Kong , Shenzhen, China B.E. in Electronic and Information Engineering	Sept 2018 – May 2022

EXPERIENCE

• Purdue University <i>Graduate Research Assistant</i> ◦ Conduct research in machine learning and quantum computing.	<i>August 2022–Present</i> West Lafayette, USA
• Purdue University <i>Graduate Teaching Assistant</i> ◦ Lead recitation sessions, hold in-person and online office hours, and grade exams.	<i>August 2022–Present</i> West Lafayette, USA

PROJECTS

• Theoretical Research on Reinforcement Learning <i>Tools: mathematical analysis, stochastic processes, nonlinear optimization</i> ◦ Analyze RL algorithms with general policy parameterizations and prove optimal global convergence rates across multiple settings. ◦ Establish order-optimal convergence-rate results for average-reward RL in several settings.	<i>August 2023–Present</i>
• Applications of Reinforcement Learning <i>Tools: PyTorch, NumPy, Pandas</i> ◦ Contributed to RLLTE , a modular RL framework (470+ GitHub stars). ◦ Designed a model-based RL algorithm that learns inter-vehicle dynamics for efficient lane changing.	<i>August 2023–Present</i>

PUBLICATIONS

- **Y. Xu**, W. Mondal, V. Aggarwal, “Finite-Sample Analysis of Policy Evaluation for Robust Average Reward Reinforcement Learning,” *NeurIPS*, 2025.
- **Y. Xu***, S. Ganesh*, W. Mondal, Q. Bai, V. Aggarwal, “Global Convergence for Average Reward Constrained MDPs with Primal-Dual Natural Actor Critic Algorithm,” *NeurIPS*, 2025.
- B. Ganguly*, **Y. Xu***, V. Aggarwal, “Quantum Speedups in Regret Analysis of Infinite Horizon Average-Reward Markov Decision Processes,” *ICML*, 2025.
- **Y. Xu**, V. Aggarwal, “Accelerating Quantum Reinforcement Learning with a Quantum Natural Policy Gradient Based Approach,” *ICML*, 2025.
- M. Yuan, Z. Zhang, **Y. Xu**, S. Luo, B. Li, X. Jin, W. Zeng, “RLLTE: Long-Term Evolution Project of Reinforcement Learning,” *AAAI*, 2025.
- J. Chen, B. Ganguly, **Y. Xu**, Y. Mei, T. Lan, V. Aggarwal, “Deep Generative Models for Offline Policy Learning: Tutorial, Survey, and Perspectives on Future Directions,” *TMLR*, 2024.
- **Y. Xu**, M. Yuan, M. O. Pun, “Transformer Empowered CSI Feedback for Massive MIMO Systems,” *IEEE WOCC*, pp. 157-161, 2021.

PREPRINTS

- **Y. Xu**, S. Ganesh, V. Aggarwal, “Efficient Q -Learning and Actor-Critic Methods for Robust Average Reward Reinforcement Learning,” *<https://arxiv.org/abs/2506.07040>*, 2025.

TEACHING EXPERIENCE

- IE23000 - Probability and Statistics in Engineering I, Purdue University *2024 Fall, 2025 Fall*
- IE59000 - Introduction to Optimization, Purdue University *2025 Spring*
- MA16500 - Calculus I, Purdue University *2023 Fall*

AWARDS

- NeurIPS Financial Aid Award *2025*
- Dean’s List Award, The Chinese University of Hong Kong, Shenzhen *2020, 2021*

SERVICES

- **Session Chair** for Purdue University PQAI Workshop 2025.
- **Reviewer** for AAAI 2025.

SKILLS

- **Programming Languages and Frameworks**: Python, C++, MATLAB, R, \LaTeX , Linux, Git