YIHAN DU

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1308 W Main Street, Urbana, IL 61801, United States

RESEARCH INTERESTS

Machine learning, with emphases on reinforcement learning (RL), online learning (in particular, multi-armed bandit) and representation learning.

EMPLOYMENT

University of Illinois Urbana-Champaign, IL, U.S. *August 2023 - Present*
Department of Electrical and Computer Engineering
Postdoctoral Researcher Advisor: Prof. R. Srikant

EDUCATION

Tsinghua University, Beijing, China *September 2018 - June 2023*
Institute for Interdisciplinary Information Sciences (headed by Prof. Andrew Chi-Chih Yao)
Ph.D. in Computer Science Advisor: Prof. Longbo Huang
Thesis: Risk-aware and Efficient Online Decision Making (Tsinghua Outstanding Doctoral Dissertation Award)

Xiamen University, Xiamen, China *September 2014 - June 2018*
B.E. in Computer Science Rank: 3/93

VISIT & INTERNSHIP

Cornell University, Ithaca, NY, U.S. *September - December 2022*
Visiting Ph.D. student (in-person) Research topic: RL and representation learning
Supervisor: Prof. Wen Sun

Microsoft Research Asia, Beijing, China *January - May 2020*
Research intern Research topic: online learning
Supervisor: Dr. Wei Chen (Director of MSR Asia Theory Center)

PREPRINT

Yihan Du, Anna Winnicki, Gal Dalal, Shie Mannor, R. Srikant, "Reinforcement Learning with Segment Feedback," Preprint, 2024.

PUBLICATIONS

Yihan Du, Anna Winnicki, Gal Dalal, Shie Mannor, R. Srikant, "Exploration-Driven Policy Optimization in RLHF: Theoretical Insights on Efficient Data Utilization," International Conference on Machine Learning (ICML), 2024.

Yihan Du, R. Srikant, Wei Chen, "Cascading Reinforcement Learning," International Conference on Learning Representations (ICLR), 2024 (spotlight, top 5%).

Yu Chen[#], **Yihan Du**, Pihe Hu, Siwei Wang, Desheng Wu, Longbo Huang, "Provably Efficient Iterated CVaR Reinforcement Learning with Function Approximation and Human Feedback," International Conference on Learning Representations (ICLR), 2024 ([#]graduate student mentored with my Ph.D. advisor).

Nuoya Xiong[#], **Yihan Du**, Longbo Huang, "Provably Safe Reinforcement Learning with Step-wise Violation Constraints," Proceedings of the Conference on Neural Information Processing Systems (NeurIPS), 2023 ([#]undergraduate student mentored with my Ph.D. advisor).

Yihan Du, Longbo Huang, Wen Sun, "Multi-task Representation Learning for Pure Exploration in Linear Bandits," International Conference on Machine Learning (ICML), 2023.

Yihan Du, Siwei Wang, Longbo Huang, "Provably Efficient Risk-Sensitive Reinforcement Learning: Iterated CVaR and Worst Path," International Conference on Learning Representations (ICLR), 2023.

Yihan Du, Wei Chen, Yuko Kuroki, Longbo Huang, "Collaborative Pure Exploration in Kernel Bandit," International Conference on Learning Representations (ICLR), 2023.

Yihan Du, Wei Chen, "Branching Reinforcement Learning," International Conference on Machine Learning (ICML), 2022.

Yihan Du, Siwei Wang, Zhixuan Fang, Longbo Huang, "Continuous Mean-Covariance Bandits," Proceedings of the Conference on Neural Information Processing Systems (NeurIPS), 2021.

Yihan Du, Yuko Kuroki, Wei Chen, "Combinatorial Pure Exploration with Bottleneck Reward Function," Proceedings of the Conference on Neural Information Processing Systems (NeurIPS), 2021.

Yihan Du, Siwei Wang, Longbo Huang, "A One-Size-Fits-All Solution to Conservative Bandit Problems," Proceedings of the AAAI Conference on Artificial Intelligence (AAAI), 2021.

Yihan Du*, Yuko Kuroki*, Wei Chen, "Combinatorial Pure Exploration with Full-Bandit or Partial Linear Feedback," Proceedings of the AAAI Conference on Artificial Intelligence (AAAI), 2021 (*equal contribution).

(*α-β ordering) Wei Chen, **Yihan Du**, Longbo Huang, Haoyu Zhao, "Combinatorial Pure Exploration for Dueling Bandit," International Conference on Machine Learning (ICML), 2020.

Yihan Du, Siwei Wang, Longbo Huang, "Dueling Bandits: From Two-dueling to Multi-dueling," Proceedings of the International Conference on Autonomous Agents and Multiagent Systems (AAMAS), 2020.

Yihan Du, Yan Yan, Si Chen, Yang Hua, "Object-adaptive LSTM Network for Real-time Visual Tracking with Adversarial Data Augmentation," Neurocomputing, 2019.

Yihan Du, Yan Yan, Si Chen, Yang Hua, Hanzi Wang, "Object-adaptive LSTM Network for Visual Tracking," International Conference on Pattern Recognition (ICPR), 2018.

SELECTED AWARDS

China Computer Federation (CCF) Agent and Multi-Agent System Doctoral Dissertation Award, by CCF Multi-Agent System Committee, June 2024 (the only recipient nationwide) *June 2024*

Tsinghua Outstanding Doctoral Dissertation Award, by Tsinghua University (the only recipient among CS graduates at IIIS, Tsinghua University in 2023) *June 2023*

Beijing Outstanding Graduate, by Beijing Municipal Education Commission (the only recipient among CS graduates at IIIS, Tsinghua University in 2023) *June 2023*

China National Scholarship for Ph.D. Students, by Ministry of Education of China (the only recipient among CS students at IIIS, Tsinghua University in 2022) *October 2022*

Toyota Scholarship, by Toyota and Tsinghua University *October 2021*

Huawei Academic Excellence Scholarship, by Huawei and Tsinghua University *October 2020*

Wuqing Talent Scholarship, by Wuqing District Government and Tsinghua University *October 2020*

Outstanding Graduate, by Xiamen University *June 2018*

TEACHING & MENTORING

Teaching Assistant

Stochastic Network Optimization *Spring 2021*
Graduate course (taught in English), IIIS, Tsinghua University

Introduction to Computer Science *Fall 2019*
Undergraduate course (taught in English), Yao Class, Tsinghua University

Mentoring

Joseph Keslin, undergraduate student at UIUC Math *Fall 2023-present*
Research topic: analysis of transformers Co-mentor with Prof. R. Srikant

Yu Chen, graduate student at IIIS, Tsinghua University *Summer 2023*
Research topic: risk-sensitive RL Co-mentor with Prof. Longbo Huang
Mentoring Publication: *Yu Chen*, **Yihan Du**, Pihe Hu, Siwei Wang, Desheng Wu, Longbo Huang, "Provably Efficient Iterated CVaR Reinforcement Learning with Function Approximation and Human Feedback," International Conference on Learning Representations (ICLR), 2024.

Nuoya Xiong, undergraduate student at Yao Class, Tsinghua University *Fall 2022*
Now Ph.D. student at CMU MLD
Research topic: safe RL Co-mentor with Prof. Longbo Huang
Mentoring Publication: *Nuoya Xiong*, **Yihan Du**, Longbo Huang, "Provably Safe Reinforcement Learning with Step-wise Violation Constraints," Proceedings of the Conference on Neural Information Processing Systems (NeurIPS), 2023.

INVITED TALKS

"Why is RLHF Data-Efficient in Policy Optimization," China Computer Federation (CCF) Agent and Multi-Agent System Seminar *June 2024*

"Risk-aware Online Decision Making," TrustML Young Scientist Seminar, RIKEN AIP *May 2023*

"Risk-aware Online Decision Making," MLOPT Idea Seminar, UW-Madison *April 2023*

"Combinatorial Pure Exploration for Dueling Bandit," CCF Doctoral Forum in Theoretical Computer Science (only 18 Ph.D. students in theoretical computer science are invited nationwide) *June 2021*

ACADEMIC SERVICE & ACTIVITIES

Reviewer/TPC Member

Conferences: ICML 2021-2024, NeurIPS 2021-2024, ICLR 2022-2025, AAAI 2025, AISTATS 2025, UAI 2024, INFOCOM 2025, WiOpt 2024, RLC 2024

Journals: Transactions on Pattern Analysis and Machine Intelligence (TPAMI), Journal of Machine

Learning Research (JMLR), Transactions on Networking (ToN), Transactions on Machine Learning Research (TMLR), Transactions on Network Science and Engineering (TNSE)

Social Activity

President of Graduate Union at IIIS, Tsinghua University *June 2020 - June 2021*