YUDA SONG

(858)353-5390 ◇ yudas@cs.cmu.edu ◇ yudasong.github.io ◇ github.com/yudasong

EDUCATION

Carnegie Mellon University August 2022 -
Ph.D. in Machine Learning
Advisors: Aarti Singh and J. Andrew Bagnell

Carnegie Mellon University August 2020 - December 2021
M.S. in Machine Learning
Advisor: Kris Kitani

University of California, San Diego September 2016 - June 2020
B.S. in Computer Science, B.S. in Mathematics Summa Cum Laude
Advisor: Sicun Gao

RESEARCH INTEREST

I am interested in the practical theory of interactive decision-making. My current study focuses on provably efficient setups and algorithms in Reinforcement Learning with practical applications, by leveraging existing data and the structure of the problem. I am also interested in the application of principled decision-making algorithms in large-scale real-world applications.

HONORS

Two Sigma PhD Fellowship Runner-up 2025
Neurips Outstanding Reviewer 2022

WORK EXPERIENCE

FAIR Paris May 2025 - August 2025
Student Researcher
Mentor: Remi Munos

Amazon NYC May 2024 - December 2024
Student Researcher
Mentors: Udaya Ghai and Dean Foster

Microsoft Research NYC May 2023 - August 2023
Student Researcher
Mentors: Akshay Krishnamurthy and Dylan Foster

PUBLICATION

Yuda Song, Dhruv Rohatgi, Aarti Singh, Drew Bagnell, "To Distill or Decide? Understanding the Algorithmic Trade-off in Partially Observable Reinforcement Learning", in *Conference on Neural Information Processing Systems (NeurIPS)*, 2025. https://arxiv.org/abs/2510.03207.

Yuda Song, Julia Kempe, Remi Munos, "Outcome-Based Exploration for LLM Reasoning", in *Conference on Neural Information Processing Systems (NeurIPS) ALERT Workshop*, 2025. https://arxiv.org/abs/2509.06941.

Zhaoyi Zhou, **Yuda Song**, Andrea Zanette, "Accelerating Unbiased LLM Evaluation via Synthetic Feedback", in *International Conference on Machine Learning (ICML)*, 2025. https://arxiv.org/abs/2502.10563.

Yuda Song, Hanlin Zhang, Udaya Ghai, Carson Eisenach, Sham M. Kakade, Dean Foster, "Mind the Gap: Examining the Self-Improvement Capabilities of Large Language Models", in *International Conference on Learning Representations (ICLR)*, 2025. https://arxiv.org/abs/2412.02674.

Yuda Song, Gokul Swamy, Aarti Singh, J. Andrew Bagnell, Wen Sun, "The Importance of Online Data: Understanding Preference Fine-tuning via Coverage", in *Conference on Neural Information Processing Systems (NeurIPS)*, 2024. https://arxiv.org/abs/2406.01462.

Yuda Song, Drew Bagnell, Aarti Singh, "Hybrid Reinforcement Learning from Offline Observation Alone", in *International Conference on Machine Learning (ICML)*, 2024. https://arxiv.org/abs/2406.07253.

Yuda Song, Lili Wu, Dylan J. Foster, Akshay Krishnamurthy, "Rich-Observation Reinforcement Learning with Continuous Latent Dynamics", in *International Conference on Machine Learning (ICML)*, 2024. https://arxiv.org/abs/2405.19269.

Yifei Zhou*, Ayush Sekhari*, **Yuda Song**, Wen Sun, "Offline Data Enhanced On-Policy Policy Gradient with Provable Guarantees", in *International Conference on Learning Representations (ICLR)*, 2024. https://arxiv.org/abs/2311.08384.

Alekh Agarwal*, **Yuda Song***, Wen Sun*, Kaiwen Wang*, Mengdi Wang*, Xuezhou Zhang*, "Provable Benefits of Representational Transfer in Reinforcement Learning", in *Conference on Learning Theory (COLT)*, 2023. https://arxiv.org/abs/2205.14571.

Anirudh Vemula, **Yuda Song**, Aarti Singh, Drew Bagnell, Sanjiban Choudhury, "The Virtues of Laziness in Model-based RL: A Unified Objective and Algorithms", in *International Conference on Machine Learning (ICML)*, 2023. https://arxiv.org/abs/2303.00694.

Yuda Song*, Yifei Zhou*, Ayush Sekhari, J. Andrew Bagnell, Akshay Krishnamurthy, Wen Sun, "Hybrid RL: Using Both Offline and Online Data Can Make RL Efficient", in *International Conference on Learning Representations (ICLR)*, 2023. https://arxiv.org/abs/2210.06718.

Chengzhuo Ni, **Yuda Song**, Xuezhou Zhang, Zihan Ding, Chi Jin, Mengdi Wang, "Representation Learning for General-sum Low-rank Markov Games", in *International Conference on Learning Representations (ICLR)*, 2023. https://arxiv.org/abs/2210.16976.

Xuezhou Zhang, **Yuda Song**, Masatoshi Uehara, Mengdi Wang, Alekh Agarwal, Wen Sun, " Efficient Reinforcement Learning in Block MDPs: A Model-free Representation Learning Approach", in *International Conference on Machine Learning (ICML)*, 2022. https://arxiv.org/abs/2202.00063.

Yuda Song, Ye Yuan, Wen Sun, Kris Kitani, "Online No-regret Model-Based Meta RL for Personalized Navigation", in *Learning for Dynamics & Control Conference (L4DC)*, 2022. https://arxiv.org/abs/2204.01925.

Ye Yuan, **Yuda Song**, Zhengyi Luo, Wen Sun, Kris Kitani, "Transform2Act: Learning a Transform-and-Control Policy for Efficient Agent Design", in *International Conference on Learning Representations (ICLR)*, 2022. https://arxiv.org/abs/2110.03659.

Yuda Song, Wen Sun, "PC-MLP: Model-based Reinforcement Learning with Policy Cover Guided Exploration", in *International Conference on Machine Learning (ICML)*, 2021. https://arxiv.org/abs/2107.07410.

Yuda Song, Aditi Mavalankar, Wen Sun, Sicun Gao, "Provably Efficient Model-based Policy Adaptation", in *International Conference on Machine Learning (ICML)*, 2020. https://arxiv.org/abs/2006.08051.

TEACHING EXPERIENCE

(Guest) Lecturer

- Cornell CS6789: Foundations of Reinforcement Learning (Fall 2024)

· CMU 10734: Foundations of Autonomous Decision Making under Uncertainty (Fall 2024)

Teaching Assistant

· CMU 10734: Foundations of Autonomous Decision Making under Uncertainty (Fall 2024)
· UCSD CSE291: Topics in Search and Optimization (Winter 2020)
· UCSD CSE154: Deep Learning (Fall 2019)
· UCSD CSE150: Introduction to AI: Search and Reasoning (Winter 2019, Spring 2020)
· UCSD CSE30: Computer Organization and Systems Programming (Spring 2019, Winter 2018)
· UCSD CSE11: Introduction to CS & OOP (Fall 2018)

SERVICE

Reviewer

· Conference: AAAI (2021-2022), ICML (2021-), NeurIPS (2021-), ALT (2024-), ICLR (2022-)
· Journal: Transactions on Machine Learning Research, Journal of Machine Learning Research, IEEE Transactions on Signal Processing