Xiangyu Liu

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Education

University of Maryland, College Park **College Park, MD**
PhD student in Computer Science *Sep. 2021 – May. 2026 (expected)*
- Advisor: Kaiqing Zhang

Shanghai Jiao Tong University (SJTU) **Shanghai, China**
B.E. in Computer Science *Sep.2017 – Jun.2021*
- Zhiyuan Honors Program of Engineering (an elite program for top 5% talented students)

University of California, Berkeley **Berkeley, CA**
Exchange Student *Jan. 2020 – May 2020*
GPA: 4.0/4.0

Experience

Bloomberg AI **NY, USA**
Research intern *June.2022 – Sep.2022*
- Research on bond pricing with recurrent neural networks.

Research Interests

My research interests are centered around the fundamental aspects of (multi-agent) reinforcement learning, with a particular emphasis on the ***game-theoretical/strategic***, ***partially observable***, and ***adversarial*** settings.
Recently, my research is also extended to studying the interaction of LLM agent"s" through the lens of game theory and online learning.

Working in Progress

- Chanwoo Park*, **Xiangyu Liu***, Asuman E. Ozdaglar, Kaiqing Zhang (* denotes equal contribution)
  Do LLM Agents Have Regret? A Case Study in Online Learning and Games.
  arXiv preprint arXiv:2403.16843, 2024 (Under Review at ICLR 2025)

Publications

- **Xiangyu Liu**, Hangtian Jia, Ying Wen, Yujing Hu, Yingfeng Chen, Changjie Fan, Zhipeng Hu, Yaodong Yang
  Towards Unifying Behavioral and Response Diversity for Open-ended Learning in Zero-sum Games
  NeurIPS 2021

- **Xiangyu Liu**, Kaiqing Zhang
  Partially Observable Multi-agent RL with (Quasi-)Efficiency: The Blessing of Information Sharing
  ICML 2023

- **Xiangyu Liu**, Souradip Chakraborty, Yanchao Sun, Furong Huang
  Rethinking Adversarial Policies: A Generalized Attack Formulation and Provable Defense in

RL.
ICLR 2024 and **Outstanding Paper Award** at NeurIPS 2022 Workshop on Trustworthy and Socially Responsible Machine Learning.

- **Xiangyu Liu**, Chenghao Deng, Yanchao Sun, Yongyuan Liang, Furong Huang
  Beyond Worst-case Attacks: Robust RL with Adaptive Defense via Non-dominated Policies.
  ICLR 2024 Spotlight (Top 5%).

- Yongyuan Liang, Yanchao Sun, Ruijie Zheng, **Xiangyu Liu**, Tuomas Sandholm, Furong Huang, Stephen McAleer
  Game-theoretic Robust Reinforcement Learning Handles Temporally-coupled Perturbations.
  ICLR 2024.

- Yang Cai†, **Xiangyu Liu**†, Argyris Oikonomou†, Kaiqing Zhang† († denotes alphabetical order)
  Provable Partially Observable Reinforcement Learning with Privileged Information.
  NeurIPS 2024.

- Pankayaraj Pathmanathan, Souradip Chakraborty, **Xiangyu Liu**, Yongyuan Liang, Furong Huang
  Is Poisoning a Real Threat to LLM Alignment? Maybe More So Than You Think
  AAAI 2025.

Talks

- Talk at the 2024 INFORMS Optimization Society Conference (IOS 2024) on partially observable multi-agent RL, Houston, Texas, 2024
- Contributed talk at the TSRML workshop of NeurIPS 2022 on adversarial policies in competitive games, 2022
- Talk at RLChina on unifying diversity in open-ended learning for zero-sum games, China, 2021

Awards and Scholarships

- **Outstanding Paper Award**, NeurIPS 2022 Workshop on Trustworthy and Socially Responsible Machine Learning. 2022
- **Dean's Fellowship**, University of Maryland, College Park. 2021
- **National Scholarship** (Top 0.2% in China), Ministry of Education of P.R.China. 2018&2019
- **A-class Scholarship for Excellent Academic Performance** (Top 1% at SJTU), SJTU. 2018
- **1st Prize in Chinese College Mathematics Competitions** (Top 1 at SJTU, selected for final). 2018

Outreach

- Reviewer for UAI 2024, NeurIPS 2024, ICLR 2025, AISTATS 2025, AAMAS 2025, UAI 2025, ICML 2025
- One of student organizers of summer AI camps at UMD 2023 for K-12 students
- TAs: Common-sense reasoning in NLP (Fall 2021); Cryptography (Spring 2022)

Skills

- Programming Languages: Python, C/C++, Java, MATLAB, LaTeX
- Deep Learning Packages: PyTorch, TensorFlow