Ph.D. Openings in Computer Science (AI / EconCS / Multi-agent Systems) at Rutgers University

Xintong Wang ([Homepage](#)) at the Department of Computer Science, Rutgers University, is actively seeking motivated PhD students to start in Fall 2024. These positions are fully funded, including tuition, stipend, and medical insurance.

About Our Research Group

We are broadly interested in problems at the interface of AI and economics. Our recent focus has been on multi-agent, game-theoretic environments where agents interact, often with the aid of algorithms, and agents' desires may not reliably match up. Examples include online platforms, financial markets, a rush-hour commute, a game of poker.

We study principled ways to integrate computational tools (e.g., machine learning, simulation techniques) and economic reasoning (e.g., game theory) to explore two broad categories of problems:
(i) Understanding agent incentives and behavior to design rules or systems that can lead to socially optimal outcomes;
(ii) Addressing computational challenges that arise when operating or analyzing multi-agent systems.
Our approaches span from data modeling to algorithm design to real-world, domain-specific applications.

Below are some examples of research topics (as classified per the above category and approach):
- [(i), modeling] Developing interpretable models of agent decision-making (this can range from simple math expressions to machine learning models, e.g., deep RL models, LLMs);
- [(i), algorithm/modeling] Learning to calibrate agent decision-making models to real-world data and generate high-fidelity synthetic data of multi-agent systems;
- [(i), algorithm/modeling] Frameworks to evaluate various aspects of multi-agent systems (e.g., the fairness, robustness, sustainability);
- [(ii), algorithm] Novel mechanism designs that can balance economic and computational efficiency well;
- [(ii), algorithm] Efficiently scaling computation and equilibrium analysis of large-scale games;
- [applications] Economic platforms, recommender systems, financial markets (centralized and decentralized), blockchain and its applications, social networks, etc.

As a group, we value
- *Diversity and Interdisciplinary Perspectives:* We embrace members from different cultural and academic backgrounds, and encourage students to explore areas beyond computer science during their graduate study.
- *Collaboration:* We aim to foster a supportive culture within the group, and encourage collaborations across groups/departments and with industry partners.
- *Efficiency and Quality:* We value commitment and efficiency in our research endeavors, while encouraging students to set aside time for enjoying life and engaging in other activities.

Bio

Xintong Wang ([Homepage](#)) is starting as an Assistant Professor in the Department of Computer Science at Rutgers University in January 2024. Before joining Rutgers, she was a Postdoctoral Fellow at Harvard University, School of Engineering and Applied Sciences, working with David Parkes. Xintong received her Ph.D. in Computer Science from the University of Michigan in 2021, advised by Michael Wellman. Along the way, she gained industry experience at Microsoft Research and J.P. Morgan AI Research. She was selected as a Rising Star in EECS by UIUC in 2019 and a Rising Star in Data Science by the University of Chicago in 2022.

About Rutgers

Rutgers stands among the U.S. highest-ranked, most diverse public research universities. Rutgers Computer Science is ranked #14/#25 in AI/general computer science according to CSRankings, and has a wide range of collaborations on cutting-edge research initiatives with other departments, e.g., economics, psychology, information science, public health, urban planning and public policy, etc. Rutgers' location in the vibrant Northeast technology corridor (40 miles from NYC and 70 miles from Philadelphia) provides unique opportunities for internships, collaborations with industry leaders, and exposure to the latest advancements in the field.

Desired Qualifications

- A strong passion for research and a persistent drive to explore the unknown
- Good communication skills
- Solid background in mathematics (calculus, linear algebra, probability) and algorithm design and analysis
- Foundational knowledge of AI and machine learning
- Proficiency in programming (familiarity to machine learning frameworks/libraries)
- Prior exposure to topics in economics is helpful but not required

Application Instructions

To apply, please submit your application to the [Rutgers Computer Science Graduate program](#), and mention my name in your personal statement. The deadline for Fall 2024 Ph.D. program admission is *January 1, 2024*.

For research internship or post-doc opportunities, please contact xintong.wang@rutgers.edu. I am happy to help in seeking university-level or external fundings (e.g., fellowships).