Anri Gu

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https://github.com/anrigu|https://www.linkedin.com/in/anri-gu/|https://anrigu.github.io/

EDUCATION

University of Michigan   **August 2021 – April 2025**
Majors: Computer Science and Economics, GPA: 3.93/4.0; Angell Scholar   *Ann Arbor, MI*

University of Oxford: Hertford College   **January 2024 – June 2024**
Visiting Student   *Oxford, UK*

PUBLICATIONS

- **Anri Gu**, Yongzhao Wang, Chris Mascioli, Mithun Chakraborty, Rahul Savani, Theodore L. Turocy, Michael P. Wellman. *The Effect of Liquidity on the Spoofability of Financial Markets*. In Proceedings of the 5th ACM International Conference on AI in Finance (**ICAIF 2024**). *Oral. Best Paper Award.*

- Chris Mascioli, **Anri Gu**, Yongzhao Wang, Mithun Chakraborty, Michael P. Wellman. *A Financial Market Simulation Environment for Trading Agents using Deep Reinforcement Learning*. In Proceedings of the 5th ACM International Conference on AI in Finance **(ICAIF 2024).** *Oral.*

- Yongzhao Wang, Rahul Savani, **Anri Gu**, Chris Mascioli, Theodore L. Turocy, Michael P. Wellman. *Market Making with Learned Beta Policies*. In Proceedings of the 5th ACM International Conference on AI in Finance **(ICAIF 2024).**

- Austin Nguyen, **Anri Gu**, Michael P. Wellman. *Explicit Exploration for High-Welfare Equilibria in Game-Theoretic Multiagent Reinforcement Learning*. *In submission* at 24th International Conference on Autonomous Agents and Multiagent Systems **(AAMAS 2025).**

RESEARCH EXPERIENCE

Oxford AGT Group   **January 2024 – Present**
Advised by Prof. Edith Elkind and Prof. Jiarui Gan   *University of Oxford, Oxford, UK*

- **Mechanism Design with Menus (Current Work)**: Exploring modifications to traditional mechanism design constraints, aiming to improve overall mechanism efficiency.

Strategic Reasoning Group   **January 2023 – Present**
Advised by Prof. Michael Wellman   *University of Michigan, Ann Arbor, MI*

- **Spoofability of Financial Markets:** Analyzed the impact of liquidity, as regulated by a market maker, on the susceptibility of financial markets to spoofing.
  - Empirically demonstrated high liquidity significantly increases the robustness of markets against manipulation utilizing a high-fidelity agent based financial market simulator
  - Characterized the mechanism through which spoofing influences market dynamics and the alterations in spoofing behavior under different liquidity regimes
  - Introduced two novel market manipulation strategies that demonstrated 100-300% improved performance over the existing baseline, improving the ability to conduct future research regarding dynamics involving more advanced market manipulation strategies

- **PyMarketSim:** Open-source agent-based financial market simulator enabling rapid training and evaluation of deep Reinforcement Learning (dRL) trading agents
  - Engineered performance optimizations achieving 100-1000x speedup in market simulation compared to current state-of-the-art simulators
  - Implemented several agent trading strategies and integrated the Policy Space Response Oracles (PSRO) framework, providing a comprehensive set of tools for simulating single and multi-agent RL interactions

- **Marking Making with Beta Policies:** Empirically studied dRL beta distribution market makers and demonstrated their superiority in earning profit and regulating market dynamics over existing benchmark strategies.

- **Strategy Exploration for High-Welfare Equilibria**: Designed a novel technique that skews strategy exploration in the empirical game theoretic analysis (EGTA) methodology towards higher welfare equilibria in cooperative games
    - Designed an augmentation of the Policy Space Response Oracles (PSRO) framework that utilizes behavior cloning trained on previously collected high-welfare trajectories to guide strategy exploration towards higher social welfare equilibria
    - Demonstrated statistically significant increases in achieved equilibrium welfare over the existing benchmark algorithm (standard PSRO) across multiple game environments

PRESENTATIONS AND INVITED TALKS

Invited Talk at Blackrock Inc.   **New York City, NY**
The Effect of Liquidity on the Spoofability of Financial Markets   *December 2024*

Oral Presentation at ICAIF 2024   **Brooklyn, NY**
The Effect of Liquidity on the Spoofability of Financial Markets   *November 2024*

Invited Talk at Algorithmic Game Theory (AGT) Seminar   **Oxford, UK**
Survey of Empirical Game-Theoretic Analysis   *February 2024*

WORK EXPERIENCE

Expedia Group   **May 2023 – July 2023**
Software Engineering Intern   *Chicago, IL*

LearningA-Z   **May 2022 – August 2022**
Software Engineering Intern   *Ann Arbor, MI*

AWARDS AND HONORS

CRA Outstanding Undergraduate Researcher Award – Honorable Mention   **December 2024**

Best Paper Award at ICAIF 2024   **November 2024**
The Effect of Liquidity on the Spoofability of Financial Markets