Ryan Shi

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EDUCATION

School of Computer Science, Carnegie Mellon University, USA — Aug 2018 - June 2023
Ph.D., Societal Computing.
Advisor: Fei Fang
Committee: Rayid Ghani, Jason Hong, Milind Tambe
Thesis: Learning and Planning Towards of AI for Social Good

Swarthmore College, USA — Aug 2014 - May 2018
B.A., Mathematics and Computer Science with Honors, 4.00/4.00

Massachusetts Institute of Technology, USA — Aug 2016 - May 2017
Visiting Student, EECS, 5.00/5.00

EMPLOYMENT

University of Pittsburgh, Assistant Professor — Jan 2024 - Present
Department of Computer Science.

DataKind, Consultant — Apr 2023 - Aug 2023
Leading data science projects with various public sector organizations.

Microsoft, Research Intern — May 2022 - Aug 2022
Office of Applied Research. Recommender system's effect on organizational outcomes.

Facebook, Software Engineering Intern — May 2021 - Aug 2021
Causal modeling for feed subjective quality experiments, meta-analyses of aggregated A/B testings.

Credit Suisse, Summer Analyst — Jun 2017 - Aug 2017
Credit and equity derivative structuring, quantitative modeling group.

RESEARCH AREAS

AI for public sector, as related to sustainability, food security, public health, and more. Game theory, optimization, online learning, reinforcement learning.

DEPLOYED RESEARCH

SmartFoodRescue: Volunteer Engagement System for Food Waste and Security
We developed a set of tools that predict food rescue requests in risk and design a volunteer notification scheme. Our new notification scheme has been in use by 412 Food Rescue since February 2020. Serving over 45k users, over 8k community organizations, distributing over 124 million pounds of food.

NewsPanda and NewsSerow: Media Monitoring for Timely Conservation Action
NewsPanda is a toolkit that automatically detects and analyzes online articles related to environmental conservation and infrastructure construction. NewsPanda has been successfully deployed by the World Wide Fund for Nature (WWF) teams in the UK, India, and Nepal since February 2022. The follow-up work, NewsSerow, has been successfully deployed in collaboration with WWF Nepal and Columbia since 2023. Winner of Google AI for Good award funding. Winner of 2023 IAAI Deployed Application Award.

CyberTWEAK: Personalized Solution for Watering Hole Attacks
Chrome extension, hosted on AWS, publicly available at bit.ly/CyberTWEAK.

Selected Speaker for AAAI-25 New Faculty Highlights Program. 2025.
Talk title: "Scalable, Sustainable, Generalizable, and Responsible AI for Public Sector"

Google Academic Research Award, Google, 2024.
$75,000 unrestricted award given to research proposal "Empowering Smallholder Farmers Through Personalized Engagement".

Newell Award for Research Excellence, Carnegie Mellon University, 2024.
"For pioneering research that integrates machine learning and game theory, with sustained real-world engagement and success in solving societally important challenges." This prestigious award recognizes a most outstanding body of research work in the School of Computer Science at Carnegie Mellon University. One award is given each year.

John C. Mascaro Faculty Fellowship, University of Pittsburgh, 2024.
This prestigious fellowship provides $15,000 support for a faculty member with exemplary research in sustainability.

Finalist for Schmidt Science Fellows, Schmidt Futures, 2023.
$100K fellowship awarded annually to 20-30 STEM PhD grads for the next generation of science leaders to transcend disciplines, advance discovery, and solve the world's most pressing problems.

IAAI Deployed Application Award, Association for the Advancement of Artificial Intelligence (AAAI), 2023.
Awarded to our work with the World Wildlife Fund on the project NewsPanda: Media Monitoring for Timely Conservation Action.

Rising Star in Data Science, University of Chicago, 2022.
Selected as one of 30 top graduating PhD students and post-docs across North America in data science. Invited to participate in on-campus workshop.

Rising Star in Machine Learning and Artificial Intelligence, the University of Southern California, 2022.
Selected as one of 20 top graduating PhD students and post-docs across North America in machine learning and artificial intelligence. Invited to participate in on-campus workshop.

Siebel Scholar Award, Siebel Scholars Foundation, 2021.
Awarded annually for academic excellence and demonstrated leadership to about 90 top students from the world's leading graduate schools. `https://www.businesswire.com/news/home/20210923005006/en/Siebel-Scholars-Foundation-Announces-Class-of-2022`

Carnegie Mellon Presidential Fellowship, Carnegie Mellon University, 2021.
Awarded annually to the top Ph.D. students across all academic departments at CMU.

Upsilon Pi Epsilon Honor Society Scholarship, IEEE Computer Society, 2018.
Up to four awards are given each year to outstanding students worldwide based on based on academic achievement and extracurricular activities related to the discipline of computing.

Selected Participant for the Cornell, Maryland, Max Planck Pre-doctoral Research School, 2018.
This summer school brings together roughly 80 senior and masters CS students worldwide for mentorship and communication.

Best Paper Award, AAMAS-17 Workshop on Teams in Multiagent Systems, 2017.

Honorable Mention, CRA Outstanding Undergraduate Researcher Award, 2017.

GRANTS	Pitt Cyber Accelerator Grant, 2025, PI. Identifying and Analyzing Influencer Marketing of Pharmaceutical Products on Social Media

Pitt Cyber Accelerator Grant, 2024, Co-PI. Mitigating Misinformation in LLM-Generated Legal Summaries.

WORKING PAPERS

Zheyuan Ryan Shi, Ameesh Kapoor, Anthony Levin-Decanini, Sean Hudson, Leah Lizarondo, Rayid Ghani, Fei Fang. A Deployment Study of a Data-Driven Volunteer Engagement System for Food Security. 2023.

Zheyuan Ryan Shi, Claire Wang, Fei Fang. Artificial Intelligence for Social Good: A Survey. 2020. Available on arXiv.

BOOK CHAPTERS

Stephanie Milani, Zhicheng Zhang, Nicholay Topin, **Zheyuan Ryan Shi**, Charles Kamhoua, Evangelos E. Papalexakis, Fei Fang. Interpretable Multi-Agent Reinforcement Learning with Decision-Tree Policies. 2024. In Explainable Agency in Artificial Intelligence. CRC Press / Taylor & Francis.

Zheyuan Ryan Shi, Yiwen Yuan, Kimberly Lo, Ameesh Kapoor, Anthony Levin-Decanini, Sean Hudson, Jake Tepperman, Leah Lizarondo, Fei Fang. AI for Food Rescue. 2022. In AI for Social Impact. Edited by Milind Tambe, Fei Fang, Bryan Wilder.

RIGOROUSLY REFEREED CONFERENCE PUBLICATIONS

Naveen Raman, **Zheyuan Ryan Shi**, Fei Fang. Global Rewards in Restless Multi-Armed Bandits. In Proceedings of the 38th Annual Conference on Neural Information Processing Systems (NeurIPS-24).

Zheyuan Ryan Shi, Jiayin Zhi, Siqi Zeng, Zhicheng Zhang, Ameesh Kapoor, Sean Hudson, Hong Shen, Fei Fang. Predicting and Presenting Task Difficulty for Crowdsourcing Food Rescue Platforms. In Proceedings of the Thirty-Third ACM Web Conference (WWW-24).

Sameer Jain, Sedrick Scott Keh, Shova Chettri, Karun Dewan, Pablo Izquierdo, Johanna Prussman, Pooja Shreshtha, Cesar Suarez, **Zheyuan Ryan Shi**, Lei Li, Fei Fang. Where It Really Matters: Few-Shot Environmental Conservation Media Monitoring for Low-Resource Languages. In Proceedings of the Thirty-Eighth AAAI Conference on Artificial Intelligence (AAAI-24).

Sedrick Scott Keh⋆, **Zheyuan Ryan Shi**⋆, David J. Patterson, Nirmal Bhagabati, Karun Dewan, Areendran Gopala, Pablo Izquierdo, Debojyoti Mallick, Ambika Sharma, Pooja Shrestha, Fei Fang. NewsPanda: Media Monitoring for Timely Conservation Action. In Proceedings of the 35th Annual Conference on Innovative Applications of Artificial Intelligence (IAAI-23).

Zheyuan Ryan Shi, Zhiwei Steven Wu, Rayid Ghani, Fei Fang. Bandit Data-Driven Optimization. In Proceedings of the Thirty-Sixth AAAI Conference on Artificial Intelligence (AAAI-22).

Stephanie Milani, Zhicheng Zhang, Nicholay Topin, **Zheyuan Ryan Shi**, Charles Kamhoua, Evangelos E. Papalexakis, Fei Fang. Maviper: Learning decision tree policies for interpretable multi-agent reinforcement learning. In Proceedings of the Joint European Conference on Machine Learning and Knowledge Discovery in Databases (ECMLPKDD-2022)

Alison Hau, Fei Fang, **Zheyuan Ryan Shi**. Pallet Estimation for Food Bank Logistics Management. In Proceedings of the 4th ACM SIGCAS Conference on Computing and Sustainable Societies, Poster (COMPASS-21).

Zheyuan Ryan Shi, Leah Lizarondo, Fei Fang. A Recommender System for Crowdsourcing Food Rescue Platforms. In Proceedings of the Thirtieth ACM Web Conference (WWW-21).

Zheyuan Ryan Shi. AI for Social Good: Between My Research and the Real World. In Proceedings of the Thirty-Fifth AAAI Conference on Artificial Intelligence, Doctoral Consortium (AAAI-21).

Zheyuan Ryan Shi, Ariel D. Procaccia, Kevin S. Chan, Sridhar Venkatesan, Noam Ben-Asher, Nandi O. Leslie, Charles Kamhoua, Fei Fang. Learning and Planning in the Feature Deception Problem. In Proceedings of the Eleventh Conference on Decision and Game Theory for Security (GameSec-20).

Zheyuan Ryan Shi⋆, Yiwen Yuan⋆, Kimberly Lo, Leah Lizarondo, Fei Fang. Improving Efficiency of Volunteer-Based Food Rescue Operations. In Proceedings of the Thirty-Second Annual Conference on Innovative Applications of Artificial Intelligence (IAAI-20).

Zheyuan Ryan Shi, Aaron Schlenker, Brian Hay, Daniel Bittleston, Siyu Gao, Emily Peterson, John Trezza, Fei Fang. Draining the Water-hole: Mitigating Social Engineering Attacks with CyberTWEAK. In Proceedings of the Thirty-Second Annual Conference on Innovative Applications of Artificial Intelligence (IAAI-20).

Yufei Wang, **Zheyuan Ryan Shi**, Lantao Yu, Yi Wu, Rohit Singh, Lucas Joppa, Fei Fang. Deep Reinforcement Learning for Green Security Games with Real-Time Information. In Proceedings of the Thirty-Third AAAI Conference on Artificial Intelligence (AAAI-19). Selected for oral.

Zheyuan Ryan Shi⋆, Ziye Tang⋆, Long Tran-Thanh, Rohit Singh, Fei Fang. Designing the Game to Play: Optimizing Payoff Structure in Security Games. In Proceedings of the 27th International Joint Conference on Artificial Intelligence and the 23rd European Conference on Artificial Intelligence (IJCAI-ECAI-18).

<table>
<tr><td>Refereed
Workshop
Publications</td><td>**Zheyuan Ryan Shi**, Ameesh Kapoor, Anthony Levin-Decanini, Sean Hudson, Leah Lizarondo, Rayid Ghani, Fei Fang. A Deployment Study of a Data-Driven Volunteer Engagement System for Food Security. At the 2024 Sustainable Operations Management Workshop.</td></tr>
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Zheyuan Ryan Shi, Zhiwei Steven Wu, Rayid Ghani, Fei Fang. Bandit Data-driven Optimization: AI for Social Good and Beyond. At the Machine Learning for Economic Policy Workshop at NeurIPS-20.

Zheyuan Ryan Shi, Zhiwei Steven Wu, Rayid Ghani, Fei Fang. Bandit Data-driven Optimization: AI for Social Good and Beyond. At the Consequential Decisions in Dynamic Environments Workshop at NeurIPS-20.

Zheyuan Ryan Shi, Zhiwei Steven Wu, Rayid Ghani, Fei Fang. Bandit Data-driven Optimization: AI for Social Good and Beyond. At the Machine Learning for the Developing World Workshop at NeurIPS-20.

Zihan Zhou, **Zheyuan Ryan Shi**, Fei Fang, Yi Wu. Approximated Temporal-Induced Neural Self-Play for Finitely Repeated Bayesian Games. At the Workshop on Reinforcement Learning in Games at AAAI-20.

Yiwen Yuan, Kimberly Lo, **Zheyuan Ryan Shi**, Leah Lizarondo, Fei Fang. Efficiency and Fairness of Food Rescue Platforms: An Initial Study. At the AI for Social Good Workshop at IJCAI-19.

Zheyuan Ryan Shi, Ariel D. Procaccia, Kevin S. Chan, Sridhar Venkatesan, Noam Ben-Asher, Nandi O. Leslie, Charles Kamhoua, Fei Fang. Feature Deception Games. At the Strategic Reasoning

Workshop at IJCAI-19.

Zheyuan Ryan Shi, Ariel D. Procaccia, Kevin S. Chan, Sridhar Venkatesan, Noam Ben-Asher, Nandi O. Leslie, Charles Kamhoua, Fei Fang. Learning and Planning in Feature Deception Games. At the Machine Learning in the Presence of Strategic Behavior Workshop at EC-19.

Zheyuan Ryan Shi, Aaron Schlenker, Brian Hay, Fei Fang. Draining the Water-hole: Mitigating Social Engineering Attacks. At the Artificial Intelligence for Cyber Security (AICS) Workshop at AAAI-19.

Yufei Wang, **Zheyuan Ryan Shi**, Lantao Yu, Yi Wu, Rohit Singh, Lucas Joppa, Fei Fang. Deep Reinforcement Learning for Green Security Games with Real-Time Information. At the Reinforcement Learning in Games Workshop at AAAI-19.

Lantao Yu, Yi Wu, **Zheyuan Ryan Shi**, Rohit Singh, Lucas Joppa, Fei Fang. Deep Reinforcement Learning for Green Security Games with Real-Time Information. At the AI for Wildlife Conservation (AIWC) Workshop at IJCAI-18.

Zheyuan Ryan Shi*, Ziye Tang*, Long Tran-Thanh, Rohit Singh, Fei Fang. Designing the Game to Play: Optimizing Payoff Structure in Security Games. At the AI for Wildlife Conservation (AIWC) Workshop at IJCAI-18.

Zheyuan Ryan Shi*, Ziye Tang*, Long Tran-Thanh, Rohit Singh, Fei Fang. Designing the Game to Play: Optimizing Payoff Structure in Security Games. At the International Workshop on Optimization in Multiagent Systems (OptMAS-18) at AAMAS-18.

Dhaval Adjodah, Yan Leng, Shi Kai Chong, **Zheyuan Ryan Shi**, Peter Krafft, Alejandro Noriega, Sandy Pentland. Social Bayesian Decision Making. At the 52nd Conference on Information Sciences and Systems (CISS-18).

Zheyuan Ryan Shi, Fei Fang. Optimizing Peer Teaching to Enhance Team Performance. In Autonomous Agents and Multiagent Systems: AAMAS'17 Workshops Best Papers, Volume 10642 of Lecture Notes in Artificial Intelligence, Springer, 2017. Winner of Best Paper at TEAMAS-17.

OTHER
REFEREED
PUBLICATIONS

Zheyuan Ryan Shi, Sindhu Kutty. Strategic Reporting in Exponential Family Prediction Markets. In Proceedings of the 2016 MIT IEEE Undergraduate Research Technology Conference (IEEE URTC 2016).

INVITED
TALKS

Iterative Learning and Planning for Public Sector Applications: Deployed Studies
Nanyang Technological University, May 2024.
Singapore Management University, May 2024.
Intelligent System Program, University of Pittsburgh, February 2024.
Computer Science Colloquium, University of Pittsburgh, February 2024.
City University of Hong Kong, November 2023.
The Third Macao Conference on Smart City Technologies, November 2023.
Peking University, October 2023.
Tsinghua University, October 2023.
Nanjing University, October 2023.
Shanghai Jiao Tong University, October 2023.
Shanghai University of Finance and Economics, October 2023.
ShanghaiTech University, October 2023.

Bandit & LLM for Public Sector Applications: Deployed Studies

1st Int'l Conference on AI-generated Content, RL in the Real World Workshop, August 2023.

Iterative Learning and Planning: Innovations & Lessons through AI for Nonprofits
University of Waterloo, Department of Management Sciences, March 2023.
University of Pittsburgh, School of Computing and Information, February 2023.

Artificial Intelligence for Nonprofits: Towards Computational Sustainability That Works
University of California, Irvine, Paul Merage School of Business, December 2022.
University of Texas, Austin, McCombs School of Business, December 2022.

Towards the Science of AI for Nonprofits
University of Chicago, Data Science Institute, November 2022.
University of Southern California, Department of Computer Science, November 2022.
Microsoft Research India, Technology for Emerging Markets Speaker Series, July 2022.

From a Bag of Bagels to Bandit-Data Driven Optimization.
INFORMS Annual Conference, October 2022.
Pennsylvania State University, Young Achievers Symposium, March 2022.
Pasteur's Quadrant Seminar Series, November 2021.

Learning and Planning in Feature Deception Games
Perspecta Labs, August 2019.

SERVICES   **Workshop Organizer**
AAAI-24 Workshop on Public Sector Large Language Models: Algorithmic and Societechnical Design. 2024 (Co-organized with Hong Shen, Sera Linardi, Lei Li, Fei Fang)

CMU Symposia on AI for Social Good: 2020, 2021, 2022. (Co-organized with Fei Fang, Rex Chen)

Program Committee (Reviewer)
AAAI: 2020-2022, 2024-2025.
AAAI student track: 2024.
AAAI demo track: 2025.
IAAI: 2024.
AAMAS: 2025.
ACM COMPASS: 2021, 2022, 2023.
EAAMO: 2022.
AI for Social Good Workshops @ IJCAI-19, NeurIPS-19, IJCAI-20, AAMAS-22.
AI for Social Good Workshop @ Harvard CRCS 2020.
Try AI Outreach event @ AAAI-20.

TEACHING   **Courses taught at University of Pittsburgh**
CS 3710: Advanced Topics in AI: AI for Social Good (Graduate-level course)

- Spring 2024. 1 undergraduate + 12 graduate students enrolled.

CS 1699/2099: Special Topics in Computer Science: Machine Learning and Game Theory (undergraduate & graduate-level course)

- Fall 2024. 3 undergraduate + 2 graduate students enrolled.

Guest lectures at University of Pittsburgh
December 2024. University of Pittsburgh. Bias and Ethical Implications in AI (CS1684). Guest

lecture on *Iterative Learning and Planning for Public Sector Applications: Deployed Studies*.

November 2024. University of Pittsburgh. Data for Social Good (IE1171). Guest lecture on *Iterative Learning and Planning for Public Sector Applications: Deployed Studies*.

November 2024. University of Pittsburgh. Research topics in Computer Science (CS2001). Guest lecture on *Iterative Learning and Planning for Public Sector Applications: Deployed Studies*.

Guest lectures at other universities
February 2024. Vanderbilt University. AI for Social Impact. Guest lecture on *Iterative Learning and Planning for Public Sector Applications: Deployed Studies*.

January 2022. Carnegie Mellon University. Artificial Intelligence Methods for Social Good. Guest lecture on *Building a Recommender System for Crowdsourcing Food Rescue Platforms*.

January 2022. Carnegie Mellon University. Artificial Intelligence Methods for Social Good, Executive Education. Guest lecture on *Building a Recommender System for Crowdsourcing Food Rescue Platforms*.

January 2021. Carnegie Mellon University. Artificial Intelligence Methods for Social Good. Guest lecture on *Building a Recommender System for Crowdsourcing Food Rescue Platforms*.

PROFESSIONAL SOCIETY MEMBERSHIPS	Siebel Scholars
	Association for Computing Machinery (ACM)
	Association for Advancement of Artificial Intelligence (AAAI)
	Institute for Operations Research and the Management Sciences (INFORMS)