

Ryan Shi

Last updated: August 2023

CONTACT	ISR - TCS Hall 430, 4665 Forbes Avenue Pittsburgh, PA 15213, USA	ryanshi@pitt.edu https://ryanzshi.github.io
EDUCATION	School of Computer Science, Carnegie Mellon University, USA Ph.D., Societal Computing. Advisor: Fei Fang Committee: Rayid Ghani, Jason Hong, Milind Tambe Thesis: Learning and Planning Towards of AI for Social Good	Aug 2018 - June 2023
	Swarthmore College, USA B.A., Mathematics and Computer Science with Honors, 4.00/4.00	Aug 2014 - May 2018
	Massachusetts Institute of Technology, USA Visiting Student, EECS, 5.00/5.00	Aug 2016 - May 2017
EMPLOYMENT	University of Pittsburgh , Assistant Professor Department of Computer Science.	Jan 2024 - Present
	DataKind , Consultant Leading data science projects with various public sector organizations.	Apr 2023 - Aug 2023
	Microsoft , Research Intern Office of Applied Research. Recommender system's effect on organizational outcomes.	May 2022 - Aug 2022
	Facebook , Software Engineering Intern Causal modeling for feed subjective quality experiments, meta-analyses of aggregated A/B testings.	May 2021 - Aug 2021
	Credit Suisse , Summer Analyst Credit and equity derivative structuring, quantitative modeling group.	Jun 2017 - Aug 2017
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	Machine Learning-based Volunteer Engagement System for Community Food Waste and Security Machine learning-based app notification system deployed by 412 Food Rescue, since January 2020. Implemented large-scale A/B testing, May 2022. Running in 16 cities across North America. Permanent deployment with Amazon Web Services. Serving over 40k users, over 2k community organizations, distributing over 124 million pounds of food.	
	NewsPanda: Media Monitoring for Timely Conservation Action Deployed at WWF worldwide offices, covering over 60,000 conservation sites, since February 2022. Winner of Google AI for Good award funding. Winner of 2023 IAAI Deployed Application Award. Permanent deployment with Google Cloud.	
	CyberTWEAK: Personalized Solution for Watering Hole Attacks Chrome extension, hosted on AWS, publicly available at bit.ly/CyberTWEAK .	

AWARDS

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, the 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, the 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, 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 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.

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. 2022. Submitted to Management Science.

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

BOOK CHAPTERS

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

Sedrick Scott Keh*, **Zheyuan Ryan Shi***, David J. Patterson, Nirmal Bhagabati, Karun Dewan, Arendran 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).

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 The 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).

REFEREED
WORKSHOP
PUBLICATIONS

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^{*}, Ziyue 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^{*}, Ziyue 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

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.

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

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

Program Committee (Reviewer)

AAAI: 2020, 2021, 2022, 2024.

IAAI: 2024.

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

Teaching Assistant

CMU 17-737: Artificial Intelligence Methods for Social Good, Spring 2021.

CMU 17-737: Artificial Intelligence Methods for Social Good, Spring 2020.

Swarthmore College ECON 031: Introduction to Econometrics, Spring 2016.

Guest Lecturer

Building a Recommender System for Crowdsourcing Food Rescue Platforms.

CMU 17-737: Artificial Intelligence Methods for Social Good, January 2022.

CMU Executive Education: Artificial Intelligence Methods for Social Good, January 2022.

CMU 17-737: Artificial Intelligence Methods for Social Good, February 2021.

Other teaching positions

Math Clinician for all undergraduate math courses, Swarthmore College, Spring 2016.