Ryan Shi

Last updated: September 2022

CONTACT

ISR - TCS Hall 430, 4665 Forbes Avenue
Pittsburgh, PA 15213, USA

ryanshi@cmu.edu
https://ryanzshi.github.io

EDUCATION

School of Computer Science, Carnegie Mellon University, USA — Aug 2018 - Present
Ph.D. Candidate, Societal Computing.
Advisor: Fei Fang
Committee: Rayid Ghani, Jason Hong, Milind Tambe
Thesis: Towards the Science of AI for Nonprofits

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

Microsoft Research, 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 nonprofits, as related to sustainability, food security, public health, and more. Game theory, optimization, online learning, reinforcement learning.

DEPLOYED RESEARCH

Data-Driven Volunteer Engagement for Community Food Waste and Security
Mobile app notification scheme adopted by 412 Food Rescue, since January 2020.
Permanent deployment with Amazon Web Services.

NewsPanda: Media Monitoring for Timely Conservation Action
Deployed at WWF worldwide offices, covering over 60,000 conservation sites, since February 2022.
Permanent deployment with Google Cloud.

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

AWARDS

Siebel Scholar, 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.

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 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, 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).

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*, 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

Towards the Science of AI for Nonprofits
Technology for Emerging Markets Speaker Series, Microsoft Research India, July 2022.

From a Bag of Bagels to Bandit-Data Driven Optimization.
Young Achievers Symposium, Penn State, March 2022.
Pasteur's Quadrant Seminar Series, Google Research, November 2021.

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

Services

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

Program Committee
AAAI: 2020, 2021, 2022.
ACM COMPASS: 2021, 2022.
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.