Zheyuan Ryan Shi

Last updated: August 2020

CONTACT

Ryan Shi (preferred name)
Wean 5309, 5000 Forbes Ave
Pittsburgh, PA 15213, USA

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

EDUCATION

School of Computer Science, Carnegie Mellon University, USA
Ph.D. Student, Societal Computing. Aug 2018 - Present
Advisor: Fei Fang

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

RESEARCH INTERESTS

Online learning, data science, game theory, reinforcement learning. AI for social good, as related to social work, security and education. Deployment and evaluation of AI in non-profit settings.

DEPLOYED RESEARCH

Data-driven Optimization of Volunteer-based Community Services
Mobile app notification scheme adopted and deployed by 412 Food Rescue, since January 2020.

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

WORKING PAPERS

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

Zheyuan Ryan Shi, Zhiwei Steven Wu, Rayid Ghani, and Fei Fang. Bandit Data-driven Optimization: AI for Social Good and Beyond. Work in progress, 2020. Available on arXiv.

RIGOROUSLY REFEREED CONFERENCE PUBLICATONS

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-DC).

Zheyuan Ryan Shi, Ariel D. Procaccia, Kevin S. Chan, Sridhar Venkatesan, Noam Ben-Asher, Nandi O. Leslie, Charles Kamhoua, and 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 and 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, and 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, and 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, and 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 PUBLICATONS

Zihan Zhou, **Zheyuan Ryan Shi**, Fei Fang and 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 and 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, and 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, and 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, and 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, and 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, and 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, and 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, and 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, and Sandy Pentland. Social Bayesian Decision Making. At the 52nd Conference on Information Sciences and Systems (CISS-18).

Zheyuan Ryan Shi and 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 PUBLICATONS

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

Honors and Awards

Upsilon Pi Epsilon Honor Society Scholarship, IEEE Computer Society, 2018
Nomination to Phi Beta Kappa, 2018
Best Paper Award, First International Workshop on Teams in Multiagent Systems (TEAMAS), 2017
Honorable Mention, CRA Outstanding Undergraduate Researcher Award, 2017
Conference travel grants: AAAI-20, IJCAI-ECAI-18, RecSys-16

Services

Conference Co-organizer
2020 CMU Symposium on AI and Social Good, April 2020.

Program Committee member
AAAI-21 Special Track on AI for Social Impact, February 2021.
IJCAI-20 Workshop on AI for Social Good, January 2021.
Harvard CRCS Workshop on AI for Social Good, July 2020.
AAAI-20 Special Track on AI for Social Impact, February 2020.
AAAI-20 Outreach event Try AI, February 2020.
NeurIPS-19 Workshop on AI for Social Good, December 2019.
IJCAI-19 Workshop on AI for Social Good, August 2019.

Teaching

Teaching Assistant
Artificial intelligence methods for social good (17-737), Carnegie Mellon University, Spring 2020.
Introduction to Econometrics (ECON 031), Swarthmore College, Spring 2016.

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

Research Experience

School of Computer Science, Carnegie Mellon University Sept 2018 - Present
Working towards AI for immediate and measurable social good. Learning in games in cybersecurity and sustainability domains. Formulated and analyzed two-layer optimization in Stackelberg security games. Applied deep reinforcement learning to solve security games with online information.
Supervisor: Fei Fang

Department of Mathematics, Swarthmore College Sept 2017 - May 2018
Proposed homological symmetry and analyzed its use in topological data analysis. Experimented with planar curves and handwritten digits.
Supervisor: Noah Giansiracusa

CRCS, Harvard University Sept 2016 - May 2017
Formulated the peer teaching problem and devised algorithms to boost team performance. Published and chosen as Best Paper in TEAMAS'17. Designed and experimented with doodle polling mechanisms.
Supervisor: Fei Fang

Human Dynamics Group, Media Lab, MIT Sept 2016 - May 2017
Studied network structure in evolution strategies for deep reinforcement learning. Investigated influence patterns in SciCast prediction markets. Built DRL testing module on Amazon EC2, and Python package for the Influence Model.
Supervisor: Dhaval Adjodah

Department of Computer Science, Swarthmore College Jan 2016 - Aug 2016
Investigated incentive compatibility in exponential family prediction markets. Published at IEEE URTC'16. Designed and analyzed cryptogenography protocols.
Supervisors: Sindhu Kutty, Joshua Brody

Other Experience

Contributor, PGH.AI Mar 2020 - Present
Facilitating the accessibility and connectivity of the AI community in Pittsburgh.

The Cornell, Maryland, Max Planck Pre-doctoral Research School Aug 2018
Selected as one of the 80 attendees worldwide with scholarship.

Summer Analyst, Credit Suisse, Hong Kong Jun 2017 - Aug 2017
Credit and equity derivative structuring