

Haifeng Xu

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Director of the [Strategic IntelliGence for Machine Agents](#) (SIGMA) Research Lab
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RESEARCH INTERESTS

Agentic AI, Machine Learning, Data-driven Decision Making, Computational Economics and Multi-Agent Systems

PROFESSIONAL EXPERIENCE

Assistant Professor <i>Department of Computer Science</i> <i>University of Chicago, USA</i>	07/2022 – present
Visiting Research Scientist <i>Market Algorithms Group, Google Research, USA</i>	09/2023 – present
Alan Batson Assistant Professor <i>Department of Computer Science</i> <i>University of Virginia, USA</i>	08/2019 – 06/2022
Postdoctoral Fellow <i>Center for Research on Computation and Society (CRCS), Harvard University, USA</i> Hosts: Yiling Chen and David C. Parkes	08/2018 – 08/2019
Lecturer in Computer Science, Harvard University	09/2018 – 12/2018
Visiting Scholar, Simons Institute for the Theory of Computing Program: Economics and Computation	10/2015 – 12/2015
Intern at Google Research (2016), Yahoo! Lab (2015) and Microsoft Research (07/2011-05/2012)	

EDUCATION

Ph.D. in Computer Science <i>University of Southern California, USA</i> Advisors: Milind Tambe and Shaddin Dughmi Thesis: Information as a Double-Edged Sword in Strategic Interactions. ACM SIGecom Doctoral Dissertation Award (honorable mention) IFAAMAS Victor Lesser Distinguished Dissertation Award (runner-up)	08/2013 – 07/2018
MMath in Computational Mathematics <i>University of Waterloo, Canada</i>	08/2012 – 08/2013
B.Sc. (honours) in Mathematics <i>School of Gifted Young, University of Science & Technology of China</i> I was a member of the HUA Loo-Keng Elite Program in Mathematics	08/2008 – 07/2012

AWARDS

- Best Paper Award, the ACM Web Conference (WWW) 2024
1 out of 2008 submissions
- [AI2050 Early Career Fellow](#) 2023
- Early Career Spotlight on International Joint Conference on Artificial Intelligence (IJCAI) 2023
One of 11 recipients worldwide (most junior recipient of 2023 cohort)
- Google Faculty Research Award 2020
- ACM SIGecom Dissertation Award (honorable mention) 2019
- IFAAMAS Victor Lesser Distinguished Dissertation Award (runner-up) 2019
- Best Application System Demo Award, AAMAS 2019. 2019
- Google Ph.D. Fellowship 2017
- CAMS Prize for Excellence in Research, USC Center for Applied Mathematical Sciences 2017
- Best Paper Award, AAMAS Workshop on Security and Multi-agent Systems (SecMas) 2016
- Best Student Paper Award, AAMAS 2016 2016
- Shing-Tung Yau Chinese College Student Mathematics Contests 2011
 - Silver Medal in Applied Mathematics (Top 4 in the country)
 - Bronze Team Medal (Top 4 teams in the country)

AWARDS OF MY STUDENTS

- **Jibang Wu**, [Stigler Center PhD Dissertation Award](#) by *UChicago Booth Stigler Center* 2024
First UChicago CS PhD to win this university-wide award
- **Fan Yao**, Copenhaver Bicentennial PhD Fellowship (\$12K, merit-based) by *UVA Engineering* 2024
- **Anqi Qu**, [Rhodes Scholar](#) 2024
to support her research of applying AI to economic research
- **Haichuan Wang**, [David S. Hu Exceptional Undergrad Thesis Award](#) by *UChicago Econ* 2024
- **Yifan Guo**, GUO Moruo Scholarship (the highest undergrad honor from USTC) 2024
Yifan visits our group from University of Sci & Tech of China (USTC) to conduct undergrad thesis
- **Chenghan Zhou**, CRA Undergraduate Research Awards (honorable mention) 2021
for her research on [information design on congestion games](#), published at EC'22

SELECTED INVITED TALKS

Please refer to the [Invited Talks Section](#) for the full list

- [6]. Keynote at [AAMAS 2024 SCaLA workshop on Social Choice and Learning Algorithms](#), *Rethinking Online Content Ecosystems in the Era of Generative AIs*, May, 2024
- [5]. Keynote at [AAAI Workshop on Recommendation Ecosystems](#), *Rethinking online content ecosystems in the era of generative AIs*, February, 2024
- [4]. Invited Talk at [Yale University Micro-economic Theory Seminar](#), *Mechanism Design for Large Language Models*, November 2023

- [3]. Invited Talk at [Princeton CSML Seminar and ECE Korhammer Seminar](#), *Algorithms and Incentives in Machine Learning*, December 2023
- [2]. Invited talk at International Monetary Fund (IMF), *The Economics of Machine Learning*, June 2023
- [1]. Invited Talk at [Duke University Algorithms Seminar Series](#), *New Frontiers of Algorithmic Information Design*, November, 2023

SELECTED PROFESSIONAL SERVICE

Please refer to the [Professional Service Section](#) for the full list

- [5]. Organizing co-chair for [Midwest ML Symposium](#), 2025
- [4]. Co-organizer for [Workshop on Economics of Modern ML: Markets, Incentives, and Generative AI](#) with AAAI 2025
- [3]. Local organizing committee member and Senior AC for International Conference on Autonomous Agents and Multiagent Systems (AAMAS 2025)
- [2]. Co-organizer for tutorial [The Economics of Data and Learning](#) (with James Zou and Shuran Zheng), AAAI 2023.
- [1]. PC chair for the 13th Conference on Decision and Game Theory for Security (GameSec 2022)

FUNDED RESEARCH

Total: \approx 2.2M; My Share: \approx 1.7M

Years	Description	Total	My Share
2024-2026	AI2050 Early Career Fellowship: <i>Rethinking Online Content Ecosystems in the Era of Generative AIs</i> , sole PI;	\$300K	\$300K
2023-2026	ONR Award N00014-23-1-2802: <i>Towards Distributed and On-line Resource-allocation Partially Observable Stochastic Camouflage Games</i> , co-PI: Xu; PI: Milind Tambe	\$900K	\$428K
2023-2026	ARO Award W911NF2310030: <i>Efficient Deception-Aware Learning of Game-Theoretic Solutions for Adversarial Domains</i> , sole PI	\$416K	\$416K
2022-2025	NSF Award 2303372: <i>AF: Algorithmic Persuasion: Re-creating the Success of Mechanism Design</i> , sole PI	\$453K	\$453K
2021-2022	Google AI for Social Good Award: <i>Combating Poaching through Community Influence</i> . PI: Xu, co-PI: World Wildlife Fund	\$30K	\$10K
2020-2021	Google Faculty Research Award: <i>Boosting Ad Auctions through Better Information Design</i> . sole PI.	\$55K	\$55K
2020-2021	Global Infectious Diseases Institute: <i>Impact of Strategic Behavior on Inequities in Health Outcomes during COVID-19</i> . PI: Xu, co-PI: Deborah Hellman, Achla Marathe, Anil Vullikanti.	\$50K	\$35K

IMPACTS ON REAL-WORLD SYSTEMS

- **Optimizing Reward Mechanisms for Instagram to Incentivize Content Generation**

To incentivize content creators on Instagram to create desirable content distribution that better serves varied Instagram user populations, my PhD student Fan Yao and I successfully live-tested our mechanism on 3% of Instagram traffic (with about 10 millions of active users). Our new mechanism achieved 1.13% percent improvement for the standard industrial metric of user *like-through-rate* (LTR), i.e., the probability that a user will click the content's "like" button after reading it (for comparison, among launched algorithms, a 1% LTR improvement is considered top-performance). Additionally, our algorithm also consistently and robustly leads to improvement on other aspects such as consumption diversity and daily active users. More disclosable details are reported in our KDD'24 papers.

- **Software Assistant for the US Federal Air Marshal Service (FAMS)**

To mitigate the harm due to potential insider threat or real-time surveillance, I developed a new algorithm that enhances unpredictability in FAMS scheduling. This algorithm was integrated into the software that has been successfully delivered to FAMS by [Avata Intelligence](#).

- **PAWS (Protection Assistant for Wildlife Security)**

I have developed a novel algorithm that provides optimal randomized patrol plans against poachers whose behavior is captured via complex machine learning models. My algorithm has been integrated into PAWS, an anti-poaching software system that are in use by hundreds of national parks.

PATENTS

- Incentive Aware Aggregation of Generative Models (with Paul Duetting, Vahab Mirrokni, Renato Paes Leme, and Song Zuo), 2024
Patent No. GP-307380-00-US

PUBLICATIONS

Journal Papers

- [J7]. Weiran Shen, Minbiao Han, Weizhe Chen, Taoan Huang, Rohit Singh, **Haifeng Xu** and Fei Fang. An Extensive Study of Security Games with Strategic Informants. *Artificial Intelligence (AIJ)*, 2024.
- [J6]. You Zu, Krishnamurthy Iyer and **Haifeng Xu**. Learning to Persuade on the Fly: Robustness Against Ignorance. *Operations Research (OR)*, 2024.
- [J5]. (α - β) Ravi Sundaram, Anil Vullikanti, **Haifeng Xu** and Fan Yao. PAC-Learning for Strategic Classification. *Journal of Machine Learning Research (JMLR)*, 2023.
- [J4]. (α - β) Yakov Babichenko, Inbal Talgam-Cohen, **Haifeng Xu** and Konstantin Zabarnyi. Regret-Minimizing Bayesian Persuasion. *Games and Economic Behavior (GEB)*, 2022.
- [J3]. **Haifeng Xu**, Rasha Kashef, Hans De Sterck and Geoffrey Sanders. Efficient Algebraic Multigrid Methods for Multilevel Overlapping Co-Clustering of User-Item Relationships. *INFORMS Journal on Computing*, 2022.
- [J2]. (α - β) Shaddin Dughmi, **Haifeng Xu**. Algorithmic Bayesian Persuasion. *SIAM Journal on Computing (SICOMP)*, 2019.
- [J1]. Amulya Yadav, Hau Chan, Albert Jiang, **Haifeng Xu**, Eric Rice and Milind Tambe. Using Social Networks to Raise HIV Awareness Among Homeless Youth. *IBM Journal of Research and Development: Volume 61, Issue 6(4)*, pp. 1-10, 2017.

Refereed Conference Papers

- [C85]. (α - β) Matteo Castiglioni, Junjie Chen, Minming Li, **Haifeng Xu** and Song Zuo. A Reduction from Multi-Parameter to Single-Parameter Bayesian Contract Design, *Proceedings of the 36th ACM-SIAM Symposium on Discrete Algorithms*, 2025, (**SODA 2025**).
- [C84]. (α - β) Wei Tang, **Haifeng Xu**, Ruimin Zhang and Derek Zhu. Intrinsic Robustness of Prophet Inequality to Strategic Reward Signaling, *Proceedings of the 38th Conference on Neural Information Processing Systems*, 2024, (**NeurIPS 2024**).
- [C83]. Thomas Kleine Buening, Aadirupa Saha, Christos Dimitrakakis and **Haifeng Xu**. Strategic Linear Contextual Bandits, *Proceedings of the 38th Conference on Neural Information Processing Systems*, 2024, (**NeurIPS 2024**).
- [C82]. Fan Yao, Yiming Liao, Jingzhou Liu, Shaoliang Nie, Qifan Wang, **Haifeng Xu** and Hongning Wang. Unveiling User Satisfaction and Creator Productivity Trade-Offs in Recommendation Platforms *Proceedings of the 38th Conference on Neural Information Processing Systems*, (**NeurIPS 2024**).
- [C81]. (α - β) Yakov Babichenko, Inbal Talgam-Cohen, **Haifeng Xu** and Konstantin Zabarnyi. Algorithmic Cheap Talk. *Proceedings of the 25th ACM Conference on Economics and Computation*, 2024, (**EC 2024**).
- [C80]. (α - β) Yakov Babichenko, Inbal Talgam-Cohen, **Haifeng Xu** and Konstantin Zabarnyi. Information Design in the Principal-Agent Problem. *Proceedings of the 25th ACM Conference on Economics and Computation*, 2024, (**EC 2024**).
- [C79]. (α - β) Paul Duetting, Vahab Mirrokni, Renato Paes Leme, **Haifeng Xu**, and Song Zuo. Mechanism Design with Large Language Models. *Proceedings of the ACM Web Conference*, 2024, (**WWW 2024**), **Best Paper Award (1 out of 2008 submissions)**
Selected to be presented at the plenary session of **EC 2024** as *Highlights Beyond EC*.
- [C78]. (α - β) Jiarui Gan, Minbiao Han, Jibang Wu, and **Haifeng Xu**. Generalized Principal-Agency: Contracts, Information, Games and Beyond, *Proceedings of the 20th Conference on Web and Internet Economics*, 2024, (**WINE 2024**).
- [C77]. Jibang Wu , Ashwinkumar Badanidiyuru and **Haifeng Xu**. Auctioning with Strategically Reticent Bidders *Proceedings of the 20th Conference on Web and Internet Economics*, 2024, (**WINE 2024**).
- [C76]. Fan Yao , Chuanhao Li, Denis Nekipelov, Hongning Wang and **Haifeng Xu**. Human vs. Generative AI in Content Creation Competition: Symbiosis or Conflict? *Proceedings of the 41th International Conference on Machine Learning*, 2024, (**ICML 2024**).
- [C75]. Safwan Hossain*, Tonghan Wang*, Tao Lin*, Yiling Chen, David Parkes and **Haifeng Xu**. Multi-Sender Persuasion – A Computational Perspective, *Proceedings of the 41th International Conference on Machine Learning*, 2024, (**ICML 2024**).
- [C74]. Thomas Kleine Buening, Aadirupa Saha, Christos Dimitrakakis and **Haifeng Xu**. Bandits Meet Mechanism Design to Combat Clickbait in Online Recommendation *Proceedings of the 12th International Conference on Learning Representations*, 2024, (**ICLR 2024**), **spotlight, 5%**.
- [C73]. Zhepei Wei, Chuanhao Li, **Haifeng Xu** and Hongning Wang. Incentivized Truthful Communication for Federated Bandits. *Proceedings of the 12th International Conference on Learning Representations*, 2024, (**ICLR 2024**).
- [C72]. (equal contribution for first two authors) Niclas Boehmer, Minbiao Han, **Haifeng Xu** and Milind Tambe. Escape Sensing Games: Detection-vs-Evasion in Security Applications. *Proceedings of the 2024 European Conference on Artificial Intelligence*, (**ECAI 2024**).
- [C71]. Fan Yao , Yiming Liao, Mingzhe Wu, Chuanhao Li, Yan Zhu, James Yang, Qifan Wang, **Haifeng Xu** and Hongning Wang. User Welfare Optimization in Recommender Systems with Competing Content Creators. *Proceedings of the 30th ACM SIGKDD Conference on Knowledge Discovery and Data Mining*, 2024, (**KDD 2024**).

- [C70]. Minbiao Han, Michael Albert and **Haifeng Xu**. Learning in Online Principal-Agent Interactions: The Power of Menus. *Proceedings of the 38nd AAAI Conference on Artificial Intelligence*, (**AAAI 2024**).
- [C69]. (α - β) Junjie Chen, Minming Li, **Haifeng Xu** and Song Zuo. Bayesian Calibrated Click-Through Auction. *Proceedings of the 51st EATCS International Colloquium on Automata, Languages, and Programming*, (**ICALP 2024**).
- [C68]. Fan Yao, Chuanhao Li, Karthik Abinav Sankararaman, Yiming Liao, Yan Zhu, Qifan Wang, Hongning Wang and **Haifeng Xu**. Rethinking Incentives in Recommender Systems: Are Monotone Rewards Always Beneficial? *Proceedings of the 37th Conference on Neural Information Processing Systems*, (**NeurIPS 2023**).
- [C67]. Chaoqi Wang, Ziyu Ye, Zhe Feng, Ashwinkumar Badanidiyuru and **Haifeng Xu**. Follow-ups Also Matter: Improving Contextual Bandits via Post-serving Contexts. *Proceedings of the 37th Conference on Neural Information Processing Systems*, (**NeurIPS 2023**), **spotlight, 3.6%**.
- [C66]. Zhepei Wei, Chuanhao Li, **Haifeng Xu** and Hongning Wang. Incentivized Communication for Federated Bandits. *Proceedings of the 37th Conference on Neural Information Processing Systems*, (**NeurIPS 2023**).
- [C65]. (α - β) Krishnamurthy Iyer, **Haifeng Xu** and You Zu. Markov Persuasion Processes with Endogenous Agent Beliefs. *Proceedings of 19th Conference On Web And Internet Economics*, (**WINE 2023**).
- [C64]. **Haifeng Xu**. The Economics of Machine Learning. *Proceedings of 32nd International Joint Conference on Artificial Intelligence*, (**IJCAI 2023**), **invited paper for early career spotlight track, 11 invitees worldwide**.
- [C63]. (α - β) Jiarui Gan, Minbiao Han, Jibang Wu, and **Haifeng Xu**. Robust Stackelberg Equilibria. *Proceedings of the 24th ACM Conference on Economics and Computation*, (**EC 2023**).
- [C62]. Fan Yao, Chuanhao Li, Denis Nekipelov, Hongning Wang and **Haifeng Xu**. How Bad is Top-K Recommendation under Competing Content Creators? *Proceedings of the 40th International Conference on Machine Learning*, (**ICML 2023**), **live presentation, 2.3%**.
- [C61]. (α - β) Bolin Ding, Yiding Feng, Chien-Ju Ho, Wei Tang and **Haifeng Xu**. Competitive Information Design for Pandora's Box. *Proceedings of the 34th ACM-SIAM Symposium on Discrete Algorithms*, (**SODA 2023**).
- [C60]. Huazheng Wang, **Haifeng Xu**, Chuanhao Li, Zhiyuan Liu and Hongning Wang. Incentivizing Exploration in Linear Bandits under Information Gap. *Proceedings of 17th ACM Conference on Recommender Systems*, (**RecSys 2023**).
- [C59]. Jibang Wu, Weiran Shen, Fei Fang and **Haifeng Xu**. Inverse Game Theory for Stackelberg Games: the Blessing of Bounded Rationality. *Proceedings of the 36th Conference on Neural Information Processing Systems* (**NeurIPS'22**).
- [C58]. Ashwinkumar Badanidiyuru, Zhe Feng, Tianxi Li and **Haifeng Xu**. Incrementality Bidding via Reinforcement Learning under Mixed and Delayed Rewards. *Proceedings of the 36th Conference on Neural Information Processing Systems* (**NeurIPS'22**).
- [C57]. Stephanie Schoch, **Haifeng Xu** and Yangfeng Ji. CS-Shapley: Class-wise Shapley Values for Data Valuation in Classification. *Proceedings of the 36th Conference on Neural Information Processing Systems* (**NeurIPS'22**).
- [C56]. (α - β) Jibang Wu, Fan Yao and **Haifeng Xu**. Multi-Agent Learning for Iterative Dominance Elimination: Formal Barriers and New Algorithms. *Proceedings of the 35th Annual Conference on Learning Theory*, (**COLT 2022**).
- [C55]. Jibang Wu, Zixuan Zhang, Zhe Feng, Zhaoran Wang, Zhuoran Yang, Michael I. Jordan and **Haifeng Xu**. Sequential Information Design: Markov Persuasion Process and Its Efficient Reinforcement Learning. *Proceedings of the 23th ACM Conference on Economics and Computation*, (**EC 2022**).

- [C54]. Chenghan Zhou, Thanh H. Nguyen and **Haifeng Xu**. Algorithmic Information Design in Multi-Player Games: Possibility and Limits in Singleton Congestion. *Proceedings of the 23th ACM Conference on Economics and Computation*, (EC 2022).
- [C53]. (α - β) Yiding Feng, Wei Tang and **Haifeng Xu**. Online Bayesian Recommendation with No Regret. *Proceedings of the 23th ACM Conference on Economics and Computation*, (EC 2022).
- [C52]. Fan Yao, Chuanhao Li, Denis Nekipelov, Hongning Wang and **Haifeng Xu**. Learning from a Learning User for Optimal Recommendations. *Proceedings of the 39th International Conference on Machine Learning*, (ICML 2022).
Also selected for **spotlight presentation**(5 out of 38 accepted papers) at the [ICML 2023 workshop on Interactive Learning with Implicit Human Feedback](#).
- [C51]. (α - β) Junjie Chen, Minming Li and **Haifeng Xu**. Selling Data To a Machine Learner: Pricing via Costly Signaling. *Proceedings of the 39th International Conference on Machine Learning*, (ICML 2022).
- [C50]. Huazheng Wang, **Haifeng Xu** and Hongning Wang. When Are Linear Stochastic Bandits Attackable? *Proceedings of the 39th International Conference on Machine Learning*, (ICML 2022).
- [C49]. Chenghan Zhou, Andrew Spivey, **Haifeng Xu** and Thanh Hong Nguyen. Information Design for Multiple Independent and Self-Interested Defenders: Work Less, Pay Off More. *Proceedings of the 38th Conference on Uncertainty in Artificial Intelligence*, (UAI 2022).
- [C48]. (α - β for first two authors) Anshuka Rangi, **Haifeng Xu**, Long Tran-Thanh and Massimo Franceschetti. Understanding the Limits of Poisoning Attacks in Episodic Reinforcement Learning. *Proceedings of the 31st International Joint Conference on Artificial Intelligence (IJCAI 2022)*, **long oral**, 3.75%
- [C47]. (α - β) Quinlan Dawkins, Minbiao Han and **Haifeng Xu**. First-order Convex Fitting and Its Application to Economics and Optimization. *Proceedings of the 36nd AAAI Conference on Artificial Intelligence (AAAI 2022)*, **long oral**
- [C46]. Fan Yao, Chuanhao Li, Denis Nekipelov, Hongning Wang and **Haifeng Xu**. Learning the Optimal Recommendation from Explorative Users. *Proceedings of the 36nd AAAI Conference on Artificial Intelligence (AAAI 2022)*
- [C45]. **Haifeng Xu** and Ruggiero Cavallo. The Strange Role of Information Asymmetry in Auctions — Does More Accurate Value Estimation Benefit A Bidder? *Proceedings of the 36nd AAAI Conference on Artificial Intelligence (AAAI 2022)*, **long oral**
- [C44]. (α - β) Anshuka Rangi, Long Tran-Thanh, **Haifeng Xu** and Massimo Franceschetti. Saving Stochastic Bandits from Poisoning Attacks via Limited Data Verification. *Proceedings of the 36nd AAAI Conference on Artificial Intelligence (AAAI 2022)*, **long oral**
- [C43]. Thanh Nguyen and **Haifeng Xu**. When Can the Defender Effectively Deceive Attackers in Security Games? *Proceedings of the 36nd AAAI Conference on Artificial Intelligence (AAAI 2022)*.
- [C42]. (α - β) Yakov Babichenko, Inbal Talgam-Cohen, **Haifeng Xu** and Konstantin Zabarnyi. Multi-Channel Bayesian Persuasion. *Proceedings of the Innovations in Theoretical Computer Science (ITCS'22)*.
- [C41]. (α - β) Quinlan Dawkins, Minbiao Han and **Haifeng Xu**. The Limits of Optimal Pricing in the Dark. *Proceedings of the 35th Conference on Neural Information Processing Systems (NeurIPS'21)*.
- [C40]. Sijun Tan, Jibang Wu, Xiaohui Bei and **Haifeng Xu**. Least Square Calibration for Peer Reviews. *Proceedings of the 35th Conference on Neural Information Processing Systems (NeurIPS'21)*.
- [C39]. Chengshuai Shi, **Haifeng Xu**, Wei Xiong, Cong Shen. (Almost) Free Incentivized Exploration from Decentralized Learning Agents. *Proceedings of the 35th Conference on Neural Information Processing Systems (NeurIPS'21)*.
- [C38]. (α - β) Ravi Sundaram, Anil Vullikanti, **Haifeng Xu** and Fan Yao. PAC-Learning for Strategic Classification. *Proceedings of the 38th International Conference on Machine Learning (ICML 2021)*, **long oral**, 3%.

- [C37]. Quinlan Dawkins, Tianxi Li and **Haifeng Xu**. Diffusion Source Identification on Networks with Statistical Confidence. *Proceedings of the 38th International Conference on Machine Learning (ICML 2021)*.
- [C36]. Shuze Liu, Weiran Shen and **Haifeng Xu**. Optimal Pricing of Information. *Proceedings of the 22th ACM Conference on Economics and Computation (EC'21)*.
- [C35]. $(\alpha\text{-}\beta)$ Yakov Babichenko, Inbal Talgam-Cohen, **Haifeng Xu** and Konstantin Zabarnyi. Regret-Minimizing Bayesian Persuasion. *Proceedings of the 22th ACM Conference on Economics and Computation (EC'21)*.
- [C34]. You Zu, Krishnamurthy Iyer and **Haifeng Xu**. Learning to Persuade on the Fly: Robustness Against Ignorance. *Proceedings of the 22th ACM Conference on Economics and Computation (EC'21)*.
- [C33]. James Nachbar and Haifeng Xu. The Power of Signaling and its Intrinsic Connection to the Price of Anarchy. *Proceedings of the Third International Conference on Distributed Artificial Intelligence, (DAI'21)*.
- [C32]. Aditya Mate, Jackson A. Killian, **Haifeng Xu**, Andrew Perrault, Milind Tambe. Collapsing Bandits and Their Application to Public Health Interventions. *Proceedings of the 34th Conference on Neural Information Processing Systems (NeurIPS 2020)*.
- [C31]. $(\alpha\text{-}\beta)$ Zhe Feng, David Parkes, **Haifeng Xu**. The Intrinsic Robustness of Stochastic Bandits to Strategic Manipulation. *Proceedings of the 37th International Conference on Machine Learning (ICML 2020)*.
- [C30]. **Haifeng Xu**. On the Tractability of Public Persuasion with No Externalities. *Proceedings of the 31st ACM-SIAM Symposium on Discrete Algorithms (SODA 2020)*.
- [C29]. $(\alpha\text{-}\beta)$ Yiling Chen, **Haifeng Xu**, Shuran Zheng. Selling Information through Consulting. *Proceedings of the 31st ACM-SIAM Symposium on Discrete Algorithms (SODA 2020)*.
- [C28]. Sarah Keren, **Haifeng Xu**, David Parkes, Kofi Kwapong and Barbara Grosz. Information Shaping for Enhanced Goal Recognition of Partially-Informed Agents. *Proceedings of the 34nd AAAI Conference on Artificial Intelligence (AAAI 2020)*, **oral**.
- [C27]. Elizabeth Bondi, Hoon Oh, **Haifeng Xu**, Fei Fang, Bistra Dilkina, Milind Tambe. To Signal or Not To Signal: Exploiting Uncertain Real-Time Information in Signaling Games for Security and Sustainability. *Proceedings of the 34nd AAAI Conference on Artificial Intelligence (AAAI 2020)*, **oral**.
- [C26]. Chao Yan, **Haifeng Xu**, Yevgeniy Vorobeychik, Bo Li, Daniel Fabbri, Bradley Malin. To Warn or Not to Warn: Online Signaling in Audit Games. *Proceedings of the 36th IEEE International Conference on Data Engineering (ICDE 2020)*, **oral**.
- [C25]. Thanh Nguyen, Andrew Butler and **Haifeng Xu**. Tackling Imitative Attacker Deception in Repeated Bayesian Stackelberg Security Games. *Proceedings of the 24th European Conference on Artificial Intelligence (ECAI 2020)*.
- [C24]. Jiarui Gan, **Haifeng Xu**, Qingyu Guo, Long Tran-Thanh, Zinovi Rabinovich and Michael Wooldridge. Imitative Follower Deception in Stackelberg Games. *Proceedings of the 20th ACM Conference on Economics and Computation (EC'19)*.
- [C23]. $(\alpha\text{-}\beta)$ Thanh H. Nguyen and **Haifeng Xu**. Imitative Attacker Deception in Stackelberg Security Games. *Proceedings of the 28th International Joint Conference on Artificial Intelligence (IJCAI'19)*.
- [C22]. $(\alpha\text{-}\beta)$ Jerry Anunrojwong, Yiling Chen, Bo Waggoner and **Haifeng Xu**. Computing Equilibria of Prediction Markets via Persuasion. *Proceedings of the 15th Conference on Web and Internet Economics (WINE'19)*.
- [C21]. Omkar Thakoor, Milind Tambe, Phebe Vayanos, **Haifeng Xu**, Christopher Kiekintveld, and Fei Fang. Cyber Camouflage Games for Strategic Deception. *Proc. 10th Conference on Decision and Game Theory for Security (GameSec 2019)*.
- [C20]. **Haifeng Xu**, Kai Wang, Phebe Vayanos, Milind Tambe. Strategic Coordination of Human Patrollers and Mobile Sensors with Signaling for Security Games. *Proceedings of the 32th AAAI Conference on Artificial Intelligence (AAAI'18)*, **oral**.

- [C19]. (α - β) Ashwinkumar Badanidiyuru, Kshipra Bhawalkar, **Haifeng Xu**. Targeting and Signaling in Ad Auctions. *ACM-SIAM Symposium on Discrete Algorithms (SODA'18)*.
- [C18]. **Haifeng Xu**, Shaddin Dughmi, Milind Tambe, Venil Loyd Noronha. Mitigating the Curse of Correlation in Security Games by Entropy Maximization. *Proceedings of the 17th International Conference on Autonomous Agents and Multiagent Systems (AAMAS'18, short paper)*.
- [C17]. Aaron Schlenker, Omkar Thakoor, **Haifeng Xu**, Fei Fang, Milind Tambe, Long Tran-Thanh, Phebe Vayanos, Yevgeniy Vorobeychik. Deceiving Cyber Adversaries: A Game Theoretic Approach. *Proceedings of the 17th International Conference on Autonomous Agents and Multiagent Systems (AAMAS'18)*.
- [C16]. (α - β) Shaddin Dughmi, **Haifeng Xu**. Algorithmic Persuasion with No Externalities. *Proceedings of the 18th ACM Conference on Economics and Computation (EC'17)*.
- [C15]. **Haifeng Xu***, Benjamin Ford*, Fei Fang, Bistra Dilkina, Andrew Plumptre, Milind Tambe, Margaret Driciru, Fred Wanyama, Aggrey Rwetsiba, Mustapha Nsubaga and Joshua Mabonga. Optimal Patrol Planning for Green Security Games with Black-Box Attackers. *Proceedings of the 8th Conference on Decision and Game Theory for Security (GameSec'17)*. (*Equal Contributions)
- [C14]. Aaron Schlenker, **Haifeng Xu**, Mina Guirguis, Christopher Kiekintveld, Arunesh Sinha, Milind Tambe, Solomon Sonya, Darryl Balderas, Noah Dunstatter. Don't Bury your Head in Warnings: A Game-Theoretic Approach for Intelligent Allocation of Cyber-security Alerts. *Proceedings of the 26th International Joint Conference on Artificial Intelligence (IJCAI'17)*. **Highlighted in the press release opening the IJCAI'17 conference.**
- [C13]. (α - β) Shaddin Dughmi, **Haifeng Xu**. Algorithmic Bayesian Persuasion. *Proceedings of the 48th ACM Symposium on Theory of Computing (STOC'16)*. **Invited to SICOMP Special Issue for STOC 2016.**
- [C12]. **Haifeng Xu**. The Mysteries of Security Games: Equilibrium Computation Becomes Combinatorial Algorithm Design. *Proceedings of the 17th ACM Conference on Economics and Computation (EC'16)*. **Best paper award at the AAMAS-16 workshop on Security and Multi-agent Systems.**
- [C11]. **Haifeng Xu**, Rupert Freeman, Vincent Conitzer, Shaddin Dughmi, Milind Tambe. Signaling in Bayesian Stackelberg Games. *Proceedings of the 15th International Conference on Autonomous Agents and Multiagent Systems (AAMAS'16)*.
- [C10]. **Haifeng Xu***, Long Tran Thanh*, Nick Jennings. Playing Repeated Security Games with No Prior Knowledge. *Proceedings of the 15th International Conference on Autonomous Agents and Multiagent Systems (AAMAS'16)*. (*Equal Contributions)
- [C9]. Amulya Yadav, Hau Chan, Albert Jiang, **Haifeng Xu**, Eric Rice, Milind Tambe. Using Social Networks to Aid Homeless Shelters: Dynamic Influence Maximization Under Uncertainty. *Proceedings of the 15th International Conference on Autonomous Agents and Multiagent Systems (AAMAS'16)*. **Best student paper award.**
- [C8]. **Haifeng Xu**, Albert X. Jiang, Arunesh, Sinha, Zinovi Rabinovich, Shaddin Dughmi, Milind Tambe. Security Games with Information Leakage: Modeling and Computation. *Proceedings of the 24th International Joint Conference on Artificial Intelligence (IJCAI'15)*.
- [C7]. Yue Yin, **Haifeng Xu**, Jiarui Gan, Bo An, Albert X. Jiang. Computing Optimal Mixed Strategies for Security Games With Dynamic Payoffs. *Proceedings of the 24th International Joint Conference on Artificial Intelligence (IJCAI'15)*.
- [C6]. Zinovi Rabinovich, Albert X. Jiang, Manish Jain, **Haifeng Xu**. Information Disclosure as a Means of Security. *Proceedings of the 14th International Conference on Autonomous Agents and Multiagent Systems (AAMAS'15)*.
- [C5]. **Haifeng Xu**, Zinovi Rabinovich, Shaddin Dughmi, Milind Tambe. Exploring Information Asymmetry in Two-Stage Security Games. *Proceedings of the 29th AAAI Conference on Artificial Intelligence (AAAI'15)*.

- [C4]. **Haifeng Xu**, Fei Fang, Albert X. Jiang, Vincent Conitzer, Shaddin Dughmi, Milind Tambe. Solving Zero-Sum Security Games in Discretized Spatio-Temporal Domains. *Proceedings of the 28th AAAI Conference on Artificial Intelligence (AAAI'14)*.
- [C3]. Leandro Marcolino, **Haifeng Xu**, Albert X. Jiang, Milind Tambe, Emma Bowring. Give a Hard Problem to a Diverse Team: Exploring Large Action Spaces. *Proceedings of the 28th AAAI Conference on Artificial Intelligence (AAAI'14)*.
- [C2]. **Haifeng Xu**, Kate Larson. Improving the Efficiency of Crowdsourcing Contests. *Proceedings of the 13th International Conference on Autonomous Agents and Multiagent Systems (AAMAS'14)*.
- [C1]. **Haifeng Xu**, Bin Gao, Diyi Yang, Tieyan Liu. Predicting Advertiser Bidding Behaviors in Sponsored Search by Rationality Modeling. *Proceedings of the 22nd International Conference on World Wide Web (WWW'13)*.

ADVISING & MENTORING

PhD Students

	Year	Next Stop (and remarks)
Jibang Wu	2019 -	On 2024-2025 job market
Fan Yao	2020 -	On 2024-2025 job market, co-advised with Hongning Wang
Minbiao Han	2019 -	–
Yuwei Cheng	2023 -	–
Alec Sun	2023 -	–
Aditya Prasad	2024-	–

Postdocs

	Year	Next Stop (and remarks)
Seyed A. Esmaeili	2024 -	–
Andrzej Kaczmarczyk	2024 -	–
Ganghua Wang	2024 -	–

Undergrads and Masters

	Year	Next Stop (and remarks)
Tony Yang (Qingchuan)	2024- 4	

Anqi Qu	2023- 2024	Oxford University as a Rhodes Scholar
Lucien Liu	2023- 2024	IMC Trading (lead developer of SIGym)
Haichuan Wang	2023 -	PhD@Harvard CS (David S. Hu Exceptional Thesis Award for research on academic publication competition)
Derek Zhu	2023 -	Radix Trading (leading author NeurIPS'24 paper on Information design for sequential decisions)
Chenghan Zhou	2020 - 2022	M.s.@Princeton CS (leading-author papers at EC'22 and UAI'22; honorable mention for 2020 CRA Outstanding Undergrad Research award)
Shuze Liu	2020 - 2022	PhD@UVA CS (leading-author paper at EC'21)
Quinlan Dawkins	2020 - 2022	Start-up <i>nod.ai</i> (leading-author papers at ICML'21, NeurIPS'21 and AAAI'22)
Nijat Khanbabayev	2021 - 2022	Hudson River Trading
Sijun Tan	2020 - 2021	PhD@UC Berkeley (lead-author paper at NeurIPS'21)

Visitors

	Year	From	Remarks
Yu He	05/24 -	Undergrad at CityU Hong Kong	
Suho Shin	05/24 - 08/24	PhD at UMD	
Yifan Guo	03/23 - 08/23	Undergrad at USTC	Incoming PhD at Stanford GSB; Guo Moruo Scholarship
James Nachbar	2020 summer	Undergrad at Yale	First-author paper at DAI'21

TEACHING

Lecturer

○ UChicago CMSC 25300/35300: Math Foundations of Machine Learning (undergrad)	Spring'24
○ UChicago CMSC 35401: The Interplay of Economics and Machine Learning (grad)	Winter'24
○ UChicago CMSC 25300/35300: Math Foundations of Machine Learning (undergrad)	Spring'23
○ UChicago CMSC 27200: Theory of Algorithms (undergrad)	Winter'23
○ UChicago CMSC 35401: The Interplay of Learning and Game Theory (grad)	Autumn'22
○ UVA CS 4501: Introduction to Algorithmic Economics (undergrad)	Spring'22
○ UVA CS 4710: Artificial Intelligence (undergrad)	Fall'21

- UVA CS 6501: Topics in Learning and Game Theory (grad) Spring'21
- UVA CS 6161: Design and Analysis of Algorithms (grad) Fall'20
- UVA CS 4710: Artificial Intelligence (undergrad) Spring'20
- UVA CS 6501: Topics in Learning and Game Theory (grad) Fall'19
- Harvard CS 182: Artificial Intelligence (undergrad) Fall'18

INVITED TALKS

- [18]. *Economic Designs for Large Language Models*, invited talk at the [Translational AI Center \(TrAC\)](#), Iowa State University.
- [17]. *Large Language Models and Social Science*, invited talk at the [NSF Sponsored Workshop on AI-Enabled Scientific Revolution](#), August 2024
- [16]. *Human vs. Generative AI in Content Creation Competition: Symbiosis or Conflict?* Invited talk at the Economic Theory of Human-AI Collaboration workshop of [Econometric Society European Meetings \(ESEM\)](#), August 2024
- [15]. *Reinforcement Learning through Incentivization: Pulling Arms with Invisible Hands*. [Hungarian Machine Learning Days](#), August 2024
- [14]. *Rethinking Online Content Ecosystems in the Era of Generative AIs*
 - Keynote at [AAMAS 2024 SCaLA workshop on Social Choice and Learning Algorithms](#), May, 2024
 - Invited talk at [10th annual Midwest Workshop on Control and Game Theory](#).
 - Keynote at [AAAI Workshop on Recommendation Ecosystems](#), February, 2024
- [13]. *Mechanism Design for Large Language Models*
 - Department seminar, Management Science and Information Systems (MSIS), Rutgers University, March 2023
 - Financial Technology Thrust, Hong Kong University of Science and Technology, March 2023
 - Micro-economic Theory Seminar, Yale University, November 2023
 - CMU Guest Lecture on Topics in Machine Learning and Game Theory, November 2023
- [12]. *The Interplay of Learning and Game Theory in the Information Age*, the inaugural seminar of the *Academic Research Talk Series* at Sunrise Future, March 2023.
- [11]. *The Dynamics and Economy of Recommender Systems*
 - Kuaishou Technology Research Seminar on Recommendation, September 2023
 - Google Machine Learning Research Seminar Series, June 2023
- [10]. *Algorithms and Incentives in Machine Learning*
 - Second Joint Conference on Statistics and Data Science (JCSDS), July 2024
 - CSML Seminar and ECE Korhammer Seminar, Princeton University, December 2023
 - Statistics Seminar, University of Minnesota at Twin Cities, November 2023
- [9]. *The Economics of Machine Learning*
 - ACMS Statistics Seminar Series, University of Notre Dame, November 2023
 - Invited Early Career Spotlight Talk, IJCAI 2023, Macau, August 2023
 - Invited Talk, Center on Frontiers of Computing Studies, Peking University, August 2023

- Invited Talk, Department of Computer Science, HongKong University, August 2023
 - Invited Talk, Gaoling School of Artificial Intelligence, Renmin University, August 2023
 - Invited Talk, Department of Computer Science, Oxford University, July 2023
 - Invited Talk, International Monetary Fund (IMF), June 2023
 - Department of Computer Science Seminar, George Mason University (GMU), June 2023
 - Seminar talk at Toyota Technological Institute at Chicago (TTIC) , June 2023
- [8]. *An Isotonic Mechanism for Overlapping Ownership*, IDEAL Workshop on Trustworthiness in the Presence of Adversaries and Strategic Agents in ML, Northwestern, October 2023
- [7]. *New Frontiers of Algorithmic Information Design*
- Algorithms Seminar Series, Duke University, November, 2023
 - Invited talk at Institute for Theoretical Computer Science, Shanghai University of Finance and Economics, September 2023
- [6]. *Towards an Efficient Market for Information and Machine Learning*.
- Workshop on the Frontiers of AI in Business and Society at UIC, May 2023
 - Computer Science Seminar Series, Polytech Milan, Feb 2023
- [5]. *Markov Persuasion Process and its Reinforcement Learning*
- Harvard University, Sep 2022
 - The Institute of Automation, Chinese Academy of Sciences, Sep 2022
 - Simons Workshop on Quantifying Uncertainty, Berkeley, Sep 2022
- [4]. *Optimal Pricing of Information*
- Workshop on Data Value at UChicago, June 2022
 - The Workshop on Strategic Communication and Learning, Stony Brook Center for Game Theory, July, 2021
- [3]. *Algorithmic Information Design: Computability, Learnability and Applicability to Societal Challenges*
- The Center for Research on Computation and Society (CRCS) at Harvard, Nov 2021
 - RPI Computer Science Colloquia & Seminars, Nov 2021
- [2]. *Manipulating Learning Algorithms in Strategic Environments*
- Shanghai Finance and Economics University, August 2021
 - CMU Special Institute for Software Research Seminar, Feb 2020
 - UVA Bio-complexity Institute Seminar, Nov 2019
 - UVA Seminar on Human and Machine Intelligence, Oct 2019
- [1]. *The Double-Edged Role of Information in Security Games*
- Penn State University AI for Social Impact seminar series, Nov 2020
 - Invited guest lecture at CMU for advanced course *AI Methods for Social Good*, Spring 2020

PROFESSIONAL SERVICE

Conference (Co-)chair/organizer

- Organizing co-chair for [Midwest ML Symposium](#), 2025
- Local organizing committee member for International Conference on Autonomous Agents and Multi-agent Systems (AAMAS 2025)
- PC Co-chair for the 13th Conference on Decision and Game Theory for Security (GameSec 2022)

Tutorial Organizers/Lecturers

- Rethinking Online Content Ecosystem in the Era of Generative AI: A Multiagent System Perspective, at the 23rd International Conference on Autonomous Agents and Multi-Agent Systems, AAMAS 2024.
- [Information Design: Algorithmic Fundamentals and New Frontiers](#) (with Konstantin Zabarnyi), at the 24'th ACM Conference on Economics and Computation (EC), 2023.
- [The Economics of Data and Learning](#) (with James Zou and Shuran Zheng), AAAI 2023.
- [Algorithmic Bayesian Persuasion](#) (invited), the 17th Conference on Web and Internet Economics (WINE), Dec 2021.
- [A Primer on the Interplay of Game Theory and Machine Learning](#), Summer School on Game Theory and Social Choice, CityU Hongkong, July 2021.
- [Tutorial on Information, Persuasion and Decision Making](#) at EC 2018.

Workshop (Co-)organizers

- [Workshop on Economics of Modern ML: Markets, Incentives, and Generative AI](#) with AAAI 2025
- [IDEAL Special Program on Trustworthy and Reliable Data Science](#), Autumn 2023.
- [Chicago Region High School Teacher Workshop](#), Spring 2023.
- [Challenges in Data Economics Workshop](#) (with Annie Liang and Nicolas Lambert), Autumn 2022.
- [IDEAL Special Quarter on Data Economics](#), Autumn 2022.
- Workshop on Learning with Strategic Agents (LSA), with AAMAS 2022.
- [Workshop on Strategic Reasoning for Societal Challenges \(SRSC\)](#) with AAMAS 2019.
- [Workshop on AI for Imperfect Information Games](#) with AAAI 2018.
- [Workshop on Adversarial Reasoning in Multi-Agent Systems](#) with AAMAS 2017.

Senior Area Chair: IJCAI (2025), AAMAS (2025)

Area Chair or Senior PC: EC (2023, 2024, 2025), ICML (2024, 2025), AAAI (2019, 2020, 2021, 2022, 2023, 2024), IJCAI (2021, 2022, 2023, 2024)

Program Committee: EC (2019 – 2022), ICML (2022), NeurIPS (2021 – 2022), ICLR (2022, 2025), ALT (2022), AAAI (2018– 2019), IJCAI (2015 – 2020), WINE (2021), AAMAS (2019 – 2021), GameSec (2017 – 2019)

Journal Reviewing Activities: American Economic Review, Management Science, Operations Research, Mathematics of Operation Research, Games and Economic Behavior (GEB), Artificial Intelligence (AIJ), Journal of Artificial Intelligence Research (JAIR), Autonomous Agents and Multi-Agent Systems (JAAMAS), etc.