

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)

SELECTED AWARDS BY MY STUDENTS

- **Jibang Wu**, [Stigler Center PhD Dissertation Award](#) by *UChicago Booth Stigler Center* 2024
First UChicago CS PhD for winning this university-wide award
- **Fan Yao**, [Copenhagen PhD Fellowship](#) by *UVA Engineering* 2024
- **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

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 University 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, 2024*, (**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, 2024*, (**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, 2024*, (**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, 2024*, (**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 19'th 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]. (α - β) 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]. (α - β) 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]. (α - β) 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 Kwabong 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]. (α - β) 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]. (α - β) 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]. $(\alpha\text{-}\beta)$ 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]. $(\alpha\text{-}\beta)$ 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)
Lucien Liu	2023-	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
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.

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

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.