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Zhe Feng

Research Interests

Computational Mechanism Design, Game Theory, Machine/Deep Learning.

Professional Appointment

Research Scientist July 2021 - present.
Google Research, Mountain View.

Education

Ph.D, Computer Science, Harvard University, 2016 – 2021.
Advisor: *David C. Parkes.*
Thesis: *Machine Learning-Aided Economic Design.*

B.S, Mathematics & Applied Mathematics, Honorable Class (Zhiyuan College), Shanghai Jiao Tong University (China), 2012 – 2016.
GPA: 3.73/4.0, 3/25.
Thesis: *Convergence Analysis of Communication-Efficient Distributed Stochastic Gradient Descent.*

Publications

(* indicates alphabetic orders)

Journal papers and book chapters

[J5] **Z. Feng**, David C. Parkes, and S. Ravindranath. Machine Learning for Matching Markets. *Online Matching Theory and Market Design. 2022. To appear.*

[J4]* P. Dütting, **Z. Feng**, H. Narasimhan, D. C. Parkes, and S. Ravindranath. Optimal Auctions through Deep Learning. *Communications of the ACM, August 2021, Vol. 64 No. 8, Pages 109-116.*

[J3]* X. Deng, J. R. Edmonds, **Z. Feng**, Z. Liu, Q. Qi, and Z. Xue. Understanding PPA-Completeness. *Journal of Computer and System Sciences. Elsevier, 146-168, 2020.* **Supersedes conference version [C1].**

[J2]* P. Dütting, **Z. Feng**, N. Golowich, H. Narasimhan, D. C. Parkes, and S. Ravindranath. Machine Learning for Optimal Economic Design. *The Future of Economic Design. Springer, 495-515, 2019.*

[J1] **Z. Feng** and J. Li. An Adaptive Independence Sampler MCMC Algorithm for Bayesian Inferences of Functions. *SIAM Journal on Scientific Computing, 40(3), A1301–A1321, 2018.*

Conference papers

[C9] **Z. Feng**, S. Lahaie, J. Schneider, and J. Ye. Reserve Price Optimization for First Price Auctions in Display Advertising. *Proceedings of the 37th International Conference on Machine Learning (ICML 2021).* **Long Talk (3% acceptance rate)**.

[C8]* **Z. Feng**, G. Guruganesh, C. Liaw, A. Mehta and A. Sethi. Convergence Analysis of No-Regret Bidding Algorithms in Repeated Auctions. *The Thirty-Fifth AAAI Conference on Artificial Intelligence (AAAI 2021).*

[C7] **Z. Feng**, D. C. Parkes, and H. Xu. The Intrinsic Robustness of Stochastic Bandits to Strategic Manipulation. *Proceedings of the 37th International Conference on Machine Learning (ICML 2020).*

[C6]* P. Dütting, **Z. Feng**, H. Narasimhan, D. C. Parkes, and S. Ravindranath. Optimal Auctions through Deep Learning. *Proceedings of the 36th International Conference on Machine Learning (ICML 2019).* **Long Talk**. **Invited to appear as a Research Highlight in the Communications of the ACM.**

[C5] **Z. Feng**, O. Schrijvers, and E. Sodomka. Online Learning for Measuring Incentive Compatibility in Ad Auctions. *The Web Conference 2019 (WWW'19).*

[C4]* **Z. Feng**, C. Podimata and V. Syrgkanis. Learning to Bid Without Knowing your Value. *Proceedings of the 19th ACM Conference on Economics and Computation (EC 2018), Cornell, Ithaca, USA.*

[C3] **Z. Feng**, H. Narasimhan and D. C. Parkes. Deep Learning for Revenue-Optimal Auctions with Budgets. *Proceedings of the 17th International Conference on Autonomous Agents and Multiagent Systems (AAMAS 2018).*

[C2]* X. Deng, **Z. Feng** and C. H. Papadimitriou. Power-Law Distributions in a Two-sided Market and Net Neutrality. *Proceedings of 12th Conference on Web and Internet Economics (WINE 2016) 10123, 59-72. Montreal, Canada.*

[C1]* X. Deng, J. R. Edmonds, **Z. Feng**, Z. Liu, Q. Qi and Z. Xu. Understanding PPA-Completeness. *Proceedings of 31st Computational Complexity Conference (CCC 2016) 50, 23:1–23:25. Tokyo, Japan.*

Working papers

[U5]* A. Badanidiyuru, **Z. Feng** and G. Guruganesh. Learning to Bid in Contextual First Price Auctions. *In preparation.*

[U4] S. Ravindranath, **Z. Feng** and D. C. Parkes Deep Learning for Two-Sided Matching. *arXiv:2107.03427*

[U3] **Z. Feng** and S. Lahaie. Robust Clearing Price Mechanisms for Reserve Price Optimization. *arXiv:2107.04638*

[U2]* V. Conitzer, **Z. Feng**, D. C. Parkes, and E. Sodomka. Welfare-Preserving ε-BIC to BIC Transformation with Negligible Revenue Loss . *arXiv:2007.09579*

[U1]* X. Deng, **Z. Feng** and R. Kulkarni. Octahedral Tucker is PPA-Complete. *Preprint ECCC-TR17-118.*

Research Internships and Visits

Google Inc, Mountain View June 2020 - Sep 2020
Supervisor: Ashwinkumar Badanidiyuru Varadaraja, Guru Guruganesh, Aranyak Mehta

Google Inc, New York May 2019 - Aug 2019

Supervisor: Sébastien Lahaie, Jinchao Ye

Facebook Research, Menlo Park May 2018 – Aug 2018
Supervisor: Eric Sodomka

Microsoft Research Asia, Beijing Aug 2015–Nov 2015, Dec 2015–Feb 2016
Supervisor: Tie-yan Liu, Wei Chen

Simons Institute for the Theory of Computing Nov 2015–Dec 2015
Supervisor: Christos Papadimitriou & Xiaotie Deng

Honors & Awards

Harvard CS Outstanding PhD Dissertation Award (Honorable Mention).
Google PhD fellowship (Algorithms, Optimizations and Markets), 2019 - 2021.
Student speaker at Commencement of Shanghai Jiao Tong University, China, 2016.
Zhiyuan Excellent Student Scholarship (Highest honor in Zhiyuan College), Zhiyuan College, Shanghai Jiao Tong University, China, 2016.
"Star of Tomorrow" Internship Award, Microsoft Research Asia, Beijing, China, 2016.
Excellent Graduate Award, Shanghai Jiao Tong University, China, 2016.

Talks

Reserve Price Optimization for First Price Auctions in Display Advertising.
INFORMS Annual Meeting **(Invited)**, November 2021, Anaheim, CA, USA.
ICML'21 main conference (**Long Talk**), July 2021, Virtual.

Convergence Analysis of No-Regret Bidding Algorithms in Repeated Auctions.
AAAI'21 main conference (**Long Talk**), February 2021, Virtual.

The Intrinsic Robustness of Stochastic Bandits to Strategic Manipulation.
Google PhD fellowship Summit, July 2019, Mountain View, California, USA.
EC'19 workshop: Learning in the Presence of Strategic Behavior, June 2019, Phoenix, Arizona, USA.
ICML'20 main conference, July 2020, Virtual.

Online Learning for Measuring Incentive Compatibility in Ad Auctions.
INFORMS Annual Meeting **(Invited)**, November 2019, Seattle, Washington, USA.

Optimal Auctions through Deep Learning.
Economic Theory Workshop, University of Western Ontario, April 2021, Virtual.
ICML'19 presentation (**Long Talk**), June 2019, Long Beach, California, USA.
INFORMS Annual Meeting **(Invited)**, November 2018, Phoenix, Arizona, USA.
Facebook Research Core Data Science tech talk, June 2018, Menlo Park, USA.
Algorithmic Game Theory and Data Science workshop in EC'17, June 2017, Cambridge, USA.

Learning to Bid without Knowing your Value.
EC 2018 talk, June 2018, Cornell University, Ithaca, USA.

NIPS 2017 workshop: Learning in the Presence of Strategic Behavior, December 2017, Long Beach, USA

Deep Learning for Revenue-Optimal Auctions with Budgets.
AAMAS 2018 talk, July 2018, Stockholm, Sweden.

Power-Law Distributions in Two-sided Market and Net Neutrality.
WINE 2016 talk, December 2016, Montreal, Canada.

Professional Service

Conferences reviewing activities

NeurIPS 2021, WWW 2021 (PC), AAAI 2021 (PC), NeurIPS 2020, ICML 2020, AAAI 2020 (PC), ITCS 2019, WINE 2019, SODA 2016, WWW 2015, WINE 2017

Journal reviewing activities

IEEE Transactions on Artificial Intelligence