

Xiaohui Bei

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Research Appointments

Nanyang Assistant Professor, School of Physical and Mathematical Sciences	March 2016 - present Nanyang Technological University
Assistant Professor, School of Physical and Mathematical Sciences	September 2015 - March 2016 Nanyang Technological University
Research Fellow, Algorithms and Complexity Department Host: Kurt Mehlhorn	September 2014 - August 2015 Max Planck Institute for Informatics
Research Fellow, School of Physical and Mathematical Sciences Host: Ning Chen	September 2012 - July 2014 Nanyang Technological University

Education

Ph.D. Computer Science, Tsinghua University, 2008.9 - 2012.7

Dissertation: Budget Feasible and General Mechanism Design in Prior-Free and Bayesian Settings
Advisor: Andrew Chi-Chih Yao

B.E. Computer Science and Technology, Tsinghua University, 2004.9 - 2008.7

Research Interests

Computational Economics (Algorithmic Game Theory and Mechanism Design)
Efficiency and Fairness in Resource Allocation
Social and Information Networks, Algorithm and Combinatorial Optimization

Publications

Conference Papers

1. Xiaohui Bei, Shengxin Liu, Chung Keung Poon, Hongao Wang: **Candidate Selections with Proportional Fairness Constraints**. In *International Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, 2020, accepted
2. Xiaohui Bei, Zihao Li, Jinyan Liu, Shengxin Liu, Xinhang Lu: **Fair Division of Mixed Divisible and Indivisible Goods**. In *AAAI Conference on Artificial Intelligence (AAAI)*, 2020, accepted
3. Xiaohui Bei, Shiteng Chen, Ji Guan, Youming Qiao, Xiaoming Sun: **From independent sets and vertex colorings to isotropic spaces and isotropic decompositions: Another bridge between graphs and alternating matrix spaces**. In *Innovations in Theoretical Computer Science (ITCS)*, 2020.

4. Xiaohui Bei, Xiaoming Sun, Hao Wu, Jialin Zhang, Zhijie Zhang, Wei Zi: **Cake Cutting on Graphs: A Discrete and Bounded Proportional Protocol**. In *ACM-SIAM Symposium on Discrete Algorithms (SODA)*, 2020.
5. Nixie Lesmana, Xuan Zhang, Xiaohui Bei: **Balancing Efficiency and Fairness in On-Demand Ridesourcing**. In *Conference on Neural Information Processing Systems (NeurIPS)*, 2019.
6. Taoan Huang, Bohui Fang, Hoon Oh, Xiaohui Bei, Fei Fang: **Dynamic Trip-Vehicle Dispatch with Scheduled and On-Demand Requests**. In *The Conference on Uncertainty in Artificial Intelligence (UAI)*, 2019.
7. Xiaohui Bei, Xinhang Lu, Pasin Manurangsi, Warut Suksompong: **The Price of Fairness for Indivisible Goods**. In *International Joint Conference on Artificial Intelligence (IJCAI)*, 2019.
8. Taoan Huang, Bohui Fang, Hoon Oh, Xiaohui Bei, Fei Fang: **Optimal Trip-Vehicle Dispatch with Multi-Type Requests**. In *International Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, extended abstract, 2019.
9. Xiaohui Bei, Nick Gravin, Pinyan Lu, Zhihao Gavin Tang: **Correlation-Robust Analysis of Single Item Auction**. In *ACM-SIAM Symposium on Discrete Algorithms (SODA)*, 2019.
10. Chaoli Zhang, Fan Wu, Xiaohui Bei: **An Efficient Auction with Variable Reserve Prices for Ridesourcing**. In *Pacific Rim International Conference on Artificial Intelligence (PRICAI)*, 2018.
11. Xiaohui Bei, Guangda Huzhang, Warut Suksompong: **Truthful Fair Division without Free Disposal**. In *International Joint Conference on Artificial Intelligence (IJCAI)*, 2018.
12. Chaoli Zhang, Xiang Wang, Fan Wu, Xiaohui Bei: **Efficient Auctions with Identity-Dependent Mixed Externalities**. In *International Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, extended abstract, 2018.
13. Xiaohui Bei, Shengyu Zhang: **Algorithms for Trip-Vehicle Assignment in Ride-Sharing**. In *AAAI Conference on Artificial Intelligence (AAAI)*, 2018.
14. Xiaohui Bei, Jugal Garg, Martin Hoefer, Kurt Mehlhorn: **Earning Limits in Fisher Markets with Spending-Constraint Utilities**. In *International Symposium on Algorithmic Game Theory (SAGT)*, 2017.
15. Xiaohui Bei, Youming Qiao, Shengyu Zhang: **Networked Fairness in Cake Cutting**. In *International Joint Conference on Artificial Intelligence (IJCAI)*, 2017.
16. Guangda Huzhang, Xin Huang, Shengyu Zhang, Xiaohui Bei: **Online Roommate Allocation Problem**. In *International Joint Conference on Artificial Intelligence (IJCAI)*, 2017.
17. Xiaohui Bei, Ning Chen, Guangda Huzhang, Biaoshuai Tao, Jiajun Wu: **Cake cutting: Envy and Truth**. In *International Joint Conference on Artificial Intelligence (IJCAI)*, 2017.
18. Xiaohui Bei, Jugal Garg, Martin Hoefer, Kurt Mehlhorn: **Computing Equilibria in Markets with Budget-Additive Utilities**. In *European Symposium on Algorithms (ESA)*, 2016.
19. Xiaohui Bei, Jugal Garg, Martin Hoefer: **Ascending-Price Algorithms for Unknown Markets**. In *ACM Conference on Economics and Computation (EC)*, 2016.
20. Xiaohui Bei, Wei Chen, Jugal Garg, Martin Hoefer, Xiaoming Sun: **Learning Market Parameters using Aggregate Demand Queries**. In *AAAI Conference on Artificial Intelligence (AAAI)*, 2016.
21. Xiaohui Bei, Ning Chen, Shengyu Zhang: **Solving Linear Programming with Constraints Unknown**. In *International Colloquium on Automata, Languages, and Programming (ICALP)*, 2015.
22. Xiaohui Bei, Ning Chen, Liyu Dou, Xiangru Huang, Ruixin Qiang: **Trial and Error in Influential Social Networks**. In *ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD)*, 2013.
23. Xiaohui Bei, Ning Chen, Shengyu Zhang: **On the Complexity of Trial and Error**. In *ACM Symposium on the Theory of Computing (STOC)*, 2013.
Invited to a special issue of *SIAM Journal on Computing (SICOMP)* for selected papers from STOC 2013.

24. Xiaohui Bei, Ning Chen, Xia Hua, Biaoshuai Tao, Endong Yang: **Optimal Proportional Cake Cutting with Connected Pieces**. In *AAAI Conference on Artificial Intelligence (AAAI)*, 2012.
25. Xiaohui Bei, Ning Chen, Nick Gravin, Pinyan Lu: **Budget Feasible Mechanism Design: From Prior-Free to Bayesian**. In *ACM Symposium on the Theory of Computing (STOC)*, 449-458, 2012.
26. Xiaohui Bei, Zhiyi Huang: **Bayesian Incentive Compatibility via Fractional Assignments**. In *ACM-SIAM Symposium on Discrete Algorithms (SODA)*, 720-733, 2011.
27. Xiaohui Bei, Wei Chen, Shang-Hua Teng, Jialin Zhang, Jiajie Zhu: **Bounded Budget Betweenness Centrality Game for Strategic Network Formations**. In *European Symposium on Algorithms (ESA)*, 227-238, 2009.

Journal Papers

1. Xiaohui Bei, Jugal Garg, Martin Hoefer, Kurt Mehlhorn: **Earning and Utility Limits in Fisher Markets**. *ACM Transactions on Economics and Computation* 7(2), article 10, 2019/
2. Xiaohui Bei, Jugal Garg, Martin Hoefer: **Ascending-Price Algorithms for Unknown Markets**. *The ACM Transactions on Algorithms*. 15(3), article 37, 2019.
3. Xiaohui Bei, Ning Chen, Nick Graven, Pinyan Lu: **Prior-Free Mechanism Design via Bayesian**. In *SIAM Journal on Computing (SICOMP)*, 46(4): 1428-1448, 2017.
4. Xiaohui Bei, Wei Chen, Shang-Hua Teng, Jialin Zhang, Jiajie Zhu: **Bounded Budget Betweenness Centrality Game for Strategic Network Formations**. In *Theoretical Computer Science*, 412(52): 7147-7168, 2011.

Teaching Experience

- 2019 Fall: **MH4320 Computational Economics**, Nanyang Technological University.
- 2019 Spring: **MH1301 Discrete Mathematics**, Nanyang Technological University.
- 2018 Fall: **MAS714 Algorithms and Theory of Computing**, Nanyang Technological University.
- 2018 Spring: **MH1301 Discrete Mathematics**, Nanyang Technological University.
- 2017 Fall: **MAS714 Algorithms and Theory of Computing**, Nanyang Technological University.
- 2017 Spring: **MH1301 Discrete Mathematics**, Nanyang Technological University.
- 2016 Fall: **MAS714 Algorithms and Theory of Computing**, Nanyang Technological University.
- 2016 Spring: **MH1301 Discrete Mathematics**, Nanyang Technological University.
- 2015 Fall: **MAS714 Algorithms and Theory of Computing**, Nanyang Technological University.
- 2015 Spring: **Algorithmic Game Theory**, Max-Planck-Institute for Informatics, Germany.

Selected Honors, Awards and Fellowships

- Nanyang Assistant Professorship, Nanyang Technological University, 2016.
- Excellent Dissertation Award, Tsinghua University, 2012
- Microsoft Research Asia Fellowship, 2011

Research Grants

Demand Allocation Algorithms in Ridesourcing. AcRF Tier 2 Grant
1/2/2020-1/1/2023, Principal Investigator, S\$790,532

Exploring Hidden and Private Data in Rich Domains. Nanyang Assistant Professorship Grant
1/5/2016-31/3/2020, Principal Investigator, S\$869,800

Balancing Efficiency and Fairness in Resource Allocation Problems. Start-up Grant from NTU
1/9/15-31/3/2019, Principal Investigator, S\$100,000

Student Supervised

- Yang Chunxue (Fall 2019 -)
- Lu Xinhang (Fall 2017 -)
- Wang Hao (Fall 2017 -)
- Huzhang Guangda (Fall 2014 - Fall 2018)

Professional Services

Conference program committees

- 2020 The Web Conference (WWW 2020)
- 2020 The 34rd AAAI Conference on Artificial Intelligence (AAAI 2020)
- 2019 Fair Allocation in Multiagent Systems Workshop (FAMAS 2019)
- 2019 National Conference of Theoretical Computer Science (NCTCS 2019)
- 2019 The 30th International Symposium on Algorithms and Computation (ISAAC 2019).
- 2019 The 28th International Joint Conference on Artificial Intelligence (IJCAI 2019)
- 2019 The 18th International Conference on Autonomous Agents and Multiagent Systems (AAMAS 2019)
- 2019 The 33rd AAAI Conference on Artificial Intelligence (AAAI 2019)
- 2018 The 19th ACM Conference on Economics and Computation Conference (EC 2018)
- 2018 The 11th International Symposium on Algorithmic Game Theory (SAGT 2018)
- 2018 The 27th International Joint Conference on Artificial Intelligence (IJCAI 2018) **Distinguished Reviewer Award**
- 2018 The 32nd AAAI Conference on Artificial Intelligence (AAAI 2018)
- 2018 The 12th International Frontiers of Algorithmics Workshop (FAW 2018)
- 2017 The 31st AAAI Conference on Artificial Intelligence (AAAI 2017)
- 2017 The 26th International World Wide Web Conference (WWW 2017)
- 2017 The 13th Conference on Web and Internet Economics (WINE 2017)
- 2017 The 11th Conference on Combinatorial Optimization and Applications (COCOA 2017)
- 2016 The 30th AAAI Conference on Artificial Intelligence (AAAI 2016)
- 2016 The 12th Conference on Web and Internet Economics (WINE 2016)
- 2016 The 13th Conference on Theory and Applications of Models of Computation (TAMC 2016)
- 2015 The 29th AAAI Conference on Artificial Intelligence (AAAI 2015)

SPMS Mathematics and Economics(MAEC) program coordinator

SPMS MAS Final Year Project committee