# ZHENZHE ZHENG

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Department of Computer Science and Engineering, Shanghai Jiao Tong University

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## WORKING EXPERIENCES

**Shanghai Jiao Tong University**                                            Dec. 2019 - Now
Assistant Professor in Department of Computer Science and Engineering

**University of Illinois at Urbana-Champaign**                          Mar. 2018 - Oct. 2019
Post Doctoral in Coordinated Science Laboratory (CSL)
Advisor: Prof. R. Srikant
Research Topic: Game Theory and Optimization for Online Platform Markets

## EDUCATION

**Shanghai Jiao Tong University**                                       Mar. 2015 - Mar. 2018
Ph.D. in Computer Science
Co-Advisors: Prof. Guihai Chen and Prof. Fan Wu
Thesis: Game Models and Mechanism Design for Mobile Internet

**University of Illinois at Urbana-Champaign**                          Sep. 2016 - Mar. 2018
Visiting Scholar in Electrical and Computer Engineering
Advisor: Prof. R. Srikant
Research Topic: Dynamic Pricing for Cloud Bandwidth Markets

**Shanghai Jiao Tong University**                                       Sep. 2012 - Mar. 2015
M.S. in Computer Science
Advisor: Prof. Fan Wu
Thesis: Game Theory based Resource Management in Non-Cooperative Wireless Networks

**Xidian University**                                                   Sep. 2008 - June 2012
B.E. in Software Engineering

## RESEARCH INTERESTS

**Algorithmic Network Economics**, e.g., Game Theory and Mechanism Design.

**Online Marketplaces**, e.g., Advertising Systems, Online Platforms and Data Markets.

**Networking and Mobile Computing**, e.g., Resource Management and Intelligent on Devices.

**Machine Learning**, e.g., Reinforcement Learning.

## PUBLICATIONS

\* indicates the student mentored by me.
**Journal Papers**

**J1. Zhenzhe Zheng**, Shuo Yang, Jiapeng Xie, Fan Wu, Xiaofeng Gao, and Guihai Chen, "Designing Strategy-Proof Budget Feasible Online Mechanism for Mobile Crowdsensing with Time-Discounting Value", to appear in *IEEE Transactions on Mobile Computing* (**TMC**).

**J2. Zhenzhe Zheng**, Yanqing Peng\*, Fan Wu, Shaojie Tang, and Guihai Chen, "ARETE: On Designing Joint Online Pricing and Reward Sharing Mechanisms for Mobile Data Markets", *IEEE Transactions on Mobile Computing* (**TMC**). Volume: 19, Issue, 4, Pages 769 - 787, Sep. 2020.

**J3. Zhenzhe Zheng**, Yanqing Peng\*, Fan Wu, Shaojie Tang, and Guihai Chen, "Trading Data in the Crowd: Profit-Driven Data Acquisition for Mobile Crowdsensing", *IEEE Journal on Selected Areas in Communications* (**JSAC**). Volume 35, Issue 2, Pages 486 - 501, Feb. 2017.

**J4.** **Zhenzhe Zheng**, Fan Wu, Xiaofeng Gao, Hongzi Zhu, Shaojie Tang, and Guihai Chen, "A Budget Feasible Incentive Mechanism for Weighted Coverage Maximization in Mobile Crowdsensing", *IEEE Transactions on Mobile Computing* (**TMC**). Volume 16, Issue 9, Pages 2392 - 2407, Sep. 2017.

**J5.** **Zhenzhe Zheng**, Fan Wu, Shaojie Tang, and Guihai Chen, "AEGIS: An Unknown Combinatorial Auction Mechanism Framework for Heterogeneous Spectrum Redistribution in Non-Cooperative Wireless Networks", *IEEE/ACM Transactions on Networking* (**TON**), Volume 24, Number 3, Pages 1919-1932, June 2016.

**J6.** **Zhenzhe Zheng**, Fan Wu, and Guihai Chen, "A Strategy-Proof Combinatorial Heterogeneous Channel Auction Framework in Noncooperative Wireless Networks", *IEEE Transactions on Mobile Computing* (**TMC**), Volume 14, Number 6, Pages 1123-1137, June 2015.

**J7.** **Zhenzhe Zheng**, Yang Gui, Fan Wu, and Guihai Chen, "STAR: Strategy-Proof Double Auctions for Multi-Cloud, Multi-Tenant Bandwidth Reservation", *IEEE Transactions on Computers* (**TC**), Volume 64, Number 7, Pages 2071 - 2083, July 2015.

**J8.** Chaoyue Niu, **Zhenzhe Zheng**, Fan Wu, Shaojie Tang, and Guihai Chen, " Online Pricing with Reserve Price Constraint for Personal Data Markets", to appear in *IEEE Transactions on Knowledge and Data Engineering* (**TKDE**).

**J9.** Fan Wu, Shuo Yang, **Zhenzhe Zheng**, Shaojie Tang, and Guihai Chen, "Fine Grained User Profiling for Personalized Task Matching in Mobile Crowdsensing", to appear in *IEEE Transactions on Mobile Computing* (**TMC**). DOI: 10.1109/TMC.2020.2993963.

**J10.** Chaoyue Niu, **Zhenzhe Zheng**, Fan Wu, Xiaofeng Gao and Guihai Chen, "Achieving Data Truthfulness and Privacy Preservation in Data Markets", *Transactions on Knowledge and Data Engineering* (**TKDE**), Volume 31, Number 1, Pages 105 - 119, Jan. 2019.

**J11.** Chaoyue Niu, **Zhenzhe Zheng**, Fan Wu, Shaojie Tang, Xiaofeng Gao, and Guihai Chen, "ERATO: Trading Noisy Aggregate Statistics over Private Correlated Data", to appear in *Transactions on Knowledge and Data Engineering* (**TKDE**), 2019, DOI: 10.1109/TKDE.2019.2934100.

**J12.** Chaoyue Niu*, Minping Zhou*, **Zhenzhe Zheng**, Fan Wu, and Guihai Chen, "ERA: Towards Privacy Preservation and Verifiability for Online Ad Exchanges", *Journal of Network and Computer Applications. (JNCA)*, Volume 98, Number 15, Pages 1-10, Nov. 2017.

### Conference Papers

**C1.** **Zhenzhe Zheng** and R. Srikant: "Optimal Search Segmentation Mechanisms for Online Platform Markets", in Proceedings of the 15th Conference on Web and Internet Economics (**WINE** 2019), Columbia University, New York NY, Dec. 10-12, 2019.

**C2.** **Zhenzhe Zheng** and R. Srikant: "A Game-Theoretic Model for Product Placement in Online Platform Markets", in 8th IFAC Workshop on Distributed Estimation and Control in Networked Systems (**NecSys** 2019), Chicago, IL, USA, Sep. 16-17, 2019. Invited Paper.

**C3.** **Zhenzhe Zheng**, Weichao Mao*, Fan Wu, and Guihai Chen "Challenges and Opportunities in IoT Data Markets", in the *4th International Workshop on Social Sensing* (IEEE **SocialSense** 2019), Montreal, Canada, Apr. 15, 2019. (Invited Paper).

**C4.** **Zhenzhe Zheng**, R. Srikant, and Guihai Chen: "Pricing for Revenue Maximization in Inter-DataCenter Networks", in Proceedings of the *37th IEEE International Conference on Computer Communications* (IEEE **INFOCOM** 2018), Honolulu, HI, USA, Apr. 16-19, 2018.

**C5.** **Zhenzhe Zheng**, Yanqing Peng*, Fan Wu, Shaojie Tang, and Guihai Chen, "An Online Pricing Mechanism for Mobile Crowdsensing Data Markets", in Proceedings of the *18th ACM International Symposium on Mobile Ad Hoc Networking and Computing* (ACM **MobiHoc** 2017), Madras, Chennai, India, Jul. 10-13, 2017.

**C6.** **Zhenzhe Zheng**, Zhaoxiong Yang*, Fan Wu, and Guihai Chen, "Mechanism Design for Mobile Crowdsensing with Execution Uncertainty", in Proceedings of the *37th IEEE International Conference on Distributed Computing* (IEEE **ICDCS** 2017), Atlanta, GA, USA, June 5-8, 2017.

**C7.** Shengzhong Liu[†], **Zhenzhe Zheng**[†], Fan Wu, Shaojie Tang, and Guihai Chen: "Context-Aware Data Quality Estimation in Mobile Crowdsensing", in Proceedings of the *36th IEEE International Conference on Computer Communications* (IEEE **INFOCOM 2017**), Atlanta, GA, USA, May 1-4, 2017. ([†]: Co-Primary Authors).

**C8.** **Zhenzhe Zheng**, Fan Wu, Shaojie Tang, and Guihai Chen, "Unknown Combinatorial Auction Mechanisms for Heterogeneous Spectrum Redistribution", in Proceedings of the *15th ACM International Symposium on Mobile Ad Hoc Networking and Computing* (ACM **MobiHoc** 2014), Philadelphia, PA, USA, Aug. 11-14, 2014.

**C9.** **Zhenzhe Zheng**, Fan Wu, and Guihai Chen: "SMASHER: Strategy-Proof Combinatorial Auction Mechanisms for Heterogeneous Channel Redistribution", in Proceedings of the *14th ACM International Symposium on Mobile Ad Hoc Networking and Computing* (ACM **MobiHoc 2013**) short paper, Bangalore, Indian, Jul. 29 - Aug. 1, 2013.

**C10.** **Zhenzhe Zheng**, Juntao Wang*, Fan Wu, and Guihai Chen, "SAIL: A Strategy-Proof Combinatorial Auction Mechanism for Cooperative Communication", in Proceedings of the *19th IEEE International Conference on Parallel and Distributed Systems* (IEEE **ICPADS 2013**), Seoul, Korea, Dec. 15-18, 2013.

**C11.** Yihao Xue*, Chaoyue Niu, **Zhenzhe Zheng**, Shaojie Tang, Chengfei Lv, Fan Wu and Guihai Chen: "Toward Understanding the Influence of Individual Clients in Federated Learning", in Proceedings of the *35th AAAI Conference on Artificial Intelligence* (**AAAI** 2021), Vancouver, Canada, Feb. 2-9, 2021.

**C12.** Zhilin Zhang, Xiangyu Liu, **Zhenzhe Zheng**, Chenrui Zhang, Miao Xu, Junwei Pan, Chuan Yu, Fan Wu, Jian Xu and Kun Gai: "Multiple Performance Metrics with Deep GSP Auctions for E-commerce Advertising", in Proceedings of the *14th ACM International Web Search and Data Mining conference* (ACM **WSDM** 2021), March, Jerusalem, Israel 2021.

**C13.** Liyi Guo*, Rui Lu, Haoqi Zhang, Junqi Jin, **Zhenzhe Zheng**, Fan Wu, Jin Li, Haiyang Xu, Han Li, Wenkai Lu, Jian Xu, and Kun Gai, "A Deep Prediction Network for Understanding Advertiser Intent and Satisfaction", in Proceedings of the *29th ACM International Conference on Information and Knowledge Management* (ACM **CIKM** 2020), 19-23 October 2020.

**C14.** Xiaotian Hao, Zhaoqing Peng, Yi Ma, Guan Wang, Junqi Jin, Jianye Hao, Shan Chen, Rongquan Bai, Mingzhou Xie, Miao Xu, **Zhenzhe Zheng**, Chuan Yu, Han Li, Jian Xu, and Kun Gai, "Dynamic Knapsack Optimization Towards Efficient Multi-Channel Sequential Advertising", in Proceedings of the *Thirty-seventh International Conference on Machine Learning*, (**ICML** 2020), Vienna, Austria, July 13-18, 2020.

**C15.** Xiaotian Hao, Junqi Jin, Jin Li, Weixun Wang, Yi Ma, Jianye Hao, **Zhenzhe Zheng** , Han Li, Jian Xu, Kun Gai, "Learning to Accelerate Heuristic Searching for Large-Scale Maximum Weighted b-Matching Problems in Online Advertising", in Proceedings of the *2020 International Joint Conference on Artificial Intelligence*, (**IJCAI** 2020), Yokohama, Japan, July 11-17, 2020.

**C16.** Hongtao Lv*, Chaoli Zhang, **Zhenzhe Zheng**, Tie Luo, Fan Wu and Guihai Chen: "Mechanism Design with Predicted Task Revenue for Bike Sharing Systems", in Proceedings of the *34th AAAI Conference on Artificial Intelligence* , (**AAAI** 2020) New York NY, Feb. 7-12, 2020.

**C17.** Chaoyue Niu, **Zhenzhe Zheng**, Fan Wu, Shaojie Tang, and Guihai Chen, "Online Pricing with Reserve Price Constraint for Personal Data Markets", in Proceedings of the *36th IEEE International Conference on Data Engineering*, (IEEE **ICDE** 2020), short paper, Dallas, Texas, USA, April 20-24, 2020.

**C18.** Qinya Li*, **Zhenzhe Zheng**, Fan Wu and Guihai Chen: "Adversarial Networks-based Privacy-Preserving for 3D Reconstruction", in Proceedings of *IEEE/ACM International Symposium on Quality of Service* (IEEE/ACM **IWQoS**, 2020), 15-17 June 2020.

**C19.** Weichao Mao*, **Zhenzhe Zheng**, and Fan Wu, "Pricing for Revenue Maximization in IoT Data Markets: An Information Design Perspective", in Proceedings of the *38th Annual IEEE International Conference on Computer Communications* (IEEE **INFOCOM** 2019), Paris, France, Apr. 29 - May 2, 2019.

**C20.** Chaoyue Niu, **Zhenzhe Zheng**, Shaojie Tang, Xiaofeng Gao, and Fan Wu, "Making Big Money from Small Sensors: Trading Time-Series Data under Pufferfish Privacy", in Proceedings of the *38th Annual*

*IEEE International Conference on Computer Communications* (IEEE **INFOCOM** 2019), Paris, France, Apr. 29 - May 2, 2019.

**C21.** Chaoyue Niu, **Zhenzhe Zheng**, Fan Wu, Shaojie Tang, Xiaofeng Gao, and Guihai Chen, "Unlocking the Value of Privacy: Trading Aggregate Statistics over Private Correlated Data", in Proceedings of the *23rd ACM SIGKDD International Conference on Knowledge Discovery and Data Mining* (ACM **SIGKDD** 2018), London, UK, Aug. 19-23, 2018.

**C22.** Weichao Mao*, **Zhenzhe Zheng**, Fan Wu, and Guihai Chen, "Online Pricing for Revenue Maximization with Unknown Time Discounting Valuations". in Proceedings of the *27th International Joint Conference on Artificial Intelligence and the 23rd European Conference on Artificial Intelligence* (**IJCAI-ECAI** 2018), Stockholm, July 13-19, 2018.

**C23.** Zun Li*, **Zhenzhe Zheng**, Fan Wu, and Guihai Chen, "On Designing Optimal Data Purchasing Strategies for Online Ad Auctions". in Proceedings of the *2018 International Conference on Autonomous Agents & Multiagent Systems* (**AAMAS** 2018), Stockholm, July 11-13, 2018.

**C24.** Shuo Yang, Kunyang Han, **Zhenzhe Zheng**, Shaojie Tang, and Fan Wu: "Towards Personalized Task Matching in Mobile Crowdsensing via Fine-Grained User Profiling", in Proceedings of the *37th IEEE International Conference on Computer Communications* (IEEE **INFOCOM** 2018), Honolulu, HI, USA, Apr 16-19, 2018.

**C25.** Chaoyue Niu*, **Zhenzhe Zheng**, Fan Wu, Xiaofeng Gao, and Guihai Chen, "Trading Data in Good Faith: Integrating Truthfulness and Privacy Preservation in Data Markets", in Proceedings of the *33rd IEEE International Conference on Data Engineering*, (IEEE **ICDE**), short paper, San Diego, California, USA, April 19-22, 2017.

**C26.** Xiao Ma*, **Zhenzhe Zheng**, Fan Wu, and Guihai Chen, "Trust-Based Time Series Data Model for Mobile Crowdsensing", in Proceedings of the *2017 IEEE International Conference on Communications* (IEEE **ICC**, 2017), Paris, France, May 21-25, 2017.

**C27.** Yangsu Liu*, **Zhenzhe Zheng**, Fan Wu, and Guihai Chen, "Fault Tolerant Mechanism Design for Time Coverage in Crowdsensing System", in Proceedings of the *36th IEEE International Performance Computing and Communications Conference* (**IPCCC 2017**), San Diego, California, USA, Dec. 10-12, 2017.

**C28.** Xiang Wang*, **Zhenzhe Zheng**, Fan Wu, Xiaoju Dong, Shaojie Tang, and Guihai Chen, "Strategy-Proof Data Auctions with Negative Externalities (Extended Abstract)". in Proceedings of the *2016 International Conference on Autonomous Agents & Multiagent Systems* (**AAMAS** 2016), Singapore, May 9-13, 2016.

**C29.** Yuanyuan Li, Linghe Kong, Fan Wu, **Zhenzhe Zheng**, and Guihai Chen, "MAPM: Movement-based Adaptive Prediction Mechanism for Energy Conservation in Body Sensor Networks", in Proceedings of the *2016 IEEE Global Communications Conference* (IEEE **GLOBECOM**, 2016), Washington, DC USA, Dec. 4-8, 2016.

**C30.** Minping Zhou*, Chaoyue Niu*, **Zhenzhe Zheng**, Fan Wu, and Guihai Chen, "An Efficient, Privacy-Preserving, and Verifiable Online Auction Mechanism for Ad Exchanges", in Proceedings of the *2015 IEEE Global Communications Conference* (IEEE **GLOBECOM**, 2015), San Diego, CA, USA, Dec. 6-10, 2015.

**C31.** Fan Wu, Junming Liu*, **Zhenzhe Zheng**, and Guihai Chen, "Online Incentive Mechanisms with discounting bids". in Proceedings of the *28th AAAI Conference on Artificial Intelligence* (**AAAI** 2014), Quebec City, Canada, July 27-31, 2014.

**C32.** Yang Gui, **Zhenzhe Zheng**, Fan Wu, and Guihai Chen, "SOAR: Strategy-Proof Auction Mechanisms for Distributed Cloud Bandwidth Reservation", in Proceedings of the *14th IEEE International Conference on Communication Systems* (IEEE **ICCS**, 2014), Macau, Nov. 19 - 21, 2014. **Best Student Paper Award**.

## HONORS AND AWARDS

| | |
|---|---|
| **China Computer Federation (CCF) Excellent Doctoral Dissertation Award** | Dec. 2018 |
| **ACM China Doctoral Dissertation Award Nominee** | Nov. 2018 |
| **Excellent PhD Dissertation of Shanghai Computer Federation** | Mar. 2019 |

**Excellent PhD Dissertation of SJTU**     Mar. 2019
**Academic Stars in SJTU**     Oct. 2016
**Microsoft Research Asia Ph.D. Fellowship**     Sep. 2015
**Google Ph.D. Fellowship**     Aug. 2015
Baidu Ph.D. Scholarship Nominee     Oct. 2015
SJTU Oversea Post-Doc Program     Oct. 2017
SJTU SEIEE Scholarship for Excellent Doctoral Dissertation     Oct. 2016
National Scholarship     2017, 2014, 2011
Tang Lixin Scholarship     Aug. 2017
Excellent Graduate of Shanghai     Mar. 2015
Best Student Paper Award, IEEE ICCS     Nov. 2014
The first place TAC Ad Exchange (AdX) competition hosted by Trading Agent Research     May 2014
Student Travel Grant for IEEE ICPADS     Dec. 2013
China Aerospace Science Industry Corporation (CASIC) Scholarship     2012 - 2013
2011 International Mathematical Contest in Modeling (MCM), Honorable Mention     Apr. 2011
The $35^{th}$ ACM/ICPC Asia Regional Hangzhou site, Bronze Prize     Oct. 2010

## PROFESSIONAL ACTIVITIES

### Program Committee Member

- The 22nd International Symposium on Mobile Ad Hoc Networking and Computing (ACM MobiHoc 2021)
- The Thirty-Fifth AAAI Conference on Artificial Intelligence (AAAI 2021)
- The 16th International Conference on Mobility, Sensing and Networking (IEEE MSN 2020)
- The 4th ACM/IEEE International Conference on Internet-of-Things Design and Implementation (Posters and Demos) (IoTDI 2019)
- The 5th International Conference on Big Data Computing and Communications, (BigCom 2019)
- The 3rd International Conference on Big Data Computing and Communications, (BigCom 2017)

### Conference Reviewer

- The 20th International Symposium on Mobile Ad Hoc Networking and Computing (MobiHoc'19)
- The 38th IEEE Conference on Computer Communications (INFOCOM'19)
- IEEE/ACM International Symposium on Quality of Service (IWQoS'19)
- The Association for Computing Machinery's Special Interest Group on Measurement and Evaluation 2018, (SIGMETRICS'18)
- The 19th International Symposium on Mobile Ad Hoc Networking and Computing (MobiHoc'18)
- The 37th IEEE Conference on Computer Communications (INFOCOM'18)
- The 16th International Symposium on Modeling and Optimization in Mobile, Ad Hoc and Wireless Networks (WiOpt'18)
- FIP working group WG7.3 on performance modeling and analysis (IFIP Performance'17)
- The 36th IEEE International Conference on Distributed Computing Systems (ICDCS'16)
- The 24th IEEE International Conference on Network Protocols (ICNP'16)
- The 36th IEEE International Conference on Distributed Computing Systems (ICDCS'16)
- The 35th IEEE Conference on Computer Communications (INFOCOM'16)
- The 34th IEEE Conference on Computer Communications (INFOCOM'15)
- The 33rd IEEE Conference on Computer Communications (INFOCOM'14)
- The 23rd International Conference on Computer Communications and Networks (ICCN 2014)
- The International Conference on Computing, Networking and Communications (ICNC 2013)

### Journal Reviewer

- INFORMS Operation Research (OR)
- IEEE Transactions on Networking (TON)
- IEEE Journal on Selected Areas in Communications (JSAC)
- IEEE Transactions on Parallel and Distributed Systems (TPDS)
- IEEE Transactions on Mobile Computing (TMC)
- IEEE Transactions on Wireless Communications (TWC)
- IEEE Transactions on Knowledge and Data Engineering (TKDE)

- IEEE Transactions on Vehicular Technology (TVT)
- IEEE Transactions on Cognitive Communications and Networking
- IEEE Access
- IEEE Network Magazine
- Springer Peer-to-Peer Networking and Applications