

## Curriculum Vitae — Pingzhong Tang

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### Short Bio.

Pingzhong Tang is an associate professor and head of the Computational Economics Lab at IIS (aka. Yao class), Tsinghua University. Before joining Tsinghua, he spent two years as postdoc at CS department of CMU. He obtained PhD degree in computer science at HKUST and bachelor degree in computer science at USTC. He has been visiting scientist at Stanford University (08-09), Harvard University (10), University of California at Berkeley (15) and Microsoft research Asia (13).

Pingzhong's research is to apply computational methodologies to design, analyze and field economic mechanisms, as well as to use economic paradigms to regulate algorithm design. In particular, he is currently interested in both theoretical and applied aspects of revenue optimal mechanism design, dynamic mechanism design, as well as market design in various contexts. The applications of his research include, but are not limited to, dynamic ad auctions (currently at the A/B test phase on Baidu), buyer impression allocation in electronic commerce (currently under implementation at Taobao/Alibaba) and Water right market design (fielded in Gansu Province). His PhD thesis work on computer-aided theorem discovery in economics has been included in several textbooks.

He is an awardee of the Microsoft research Star-track program, the inaugural Alibaba Innovative research award and an invitee of the IJCAI-17 Early Career Spotlight Talk.

### Research Interests

- Artificial Intelligence, Multi-Agent System, Electronic Commerce
- Game Theory, Mechanism Design, Auction
- Applications of AI and economics to large-scale online environments

### Education

**Carnegie Mellon University,** 2010-2012,  
Post-doctoral researcher in Computer Science,  
Host: Prof. Tuomas Sandholm  
**Hong Kong University of Science and Technology,** 2005-2010,  
PhD in Computer Science,  
Advisor: Prof. Fangzhen Lin  
Thesis: Computer-aided theorem discovery  
– A new adventure and its application to economic theory  
**University of Science and Technology of China,** 2001-2005,  
Bachelor, Department of Computer science, Top 5%  
Research mentor: Prof. Xiaoping Chen

### Working Experiences

**Associate Prof.** IIS, *Tsinghua University.* 10/2012-  
• Artificial Intelligence, Economics and computation.  
• Dean: Andrew C.C Yao

**Visiting Scientist.,** Simons Institute, *UC, Berkeley.* 07/15 -12/15  
• Economics and computation program  
Host: Prof. Alistair Sinclair and Prof. Christos Papadimitriou

**Visiting researcher.** *Microsoft Research Asia.* 02/2013- 08/2013

- Mechanism design and computational advertising
- Host: Tie-Yan Liu, Principal researcher

**Visiting Scholar**, EconCS group, *Harvard University*. 10/2009 - 02/2010,

- Host: Prof. Yiling Chen
- Prediction Market, Electronic Commerce, Mechanism Design

**Visiting PhD Student** Stanford AI Lab, *Stanford University* 06/2008 - 02/2009,

- Host: Prof. Yoav Shoham
- Multi-Agent System, mechanism design

**Industrial  
consultation**

- Founding Member, Tsinghua-Alibaba Fintech lab. *Alibaba*. 2016 -
- Senior Consultant. *Baidu Inc.* 2015 - 2016
- Senior Consultant. *DiDi Inc.* 2017 -

**Teaching**

- Game theory, Spring semester, Tsinghua University. 2012-
- Economics and Computation, Fall semester, Tsinghua University. 2013-
- 5 SRT courses for mentoring undergraduate research 2013-

**Selected awards**

- IJCAI-2017 *early career spotlight* (the only one from China so far). 2017
- Nominee, “Stability of generalized two-sided markets with transaction thresholds.”, *best paper and best student paper*, AAMAS-2017. 2017
- Inaugural Alibaba Innovative Research award. 2017
- “Mechanism design and implementation for lung exchange” IJCAI-15 *Media Press Paper*. 4 out of 570 accepted papers.
- Microsoft Star-track faculty. 2013
- “Discovering Theorems in Game Theory: Two-Person Games with Unique Nash Equilibria payoff”. Pingzhong Tang, Fangzhen Lin. *AIJ hottest Article* in 2011.

**Past  
Students**

- Zihe Wang, PhD graduated in 2016, Best PhD graduate award, IIS, Tsinghua. PhD dissertation: Geometric approaches to auction design. First job: assistant professor at Shanghai University of Finance and Economics.
- Bo Zheng, PhD graduated in 2016. PhD dissertation: Incentive compatible online scheduling for cloud computing. First job: Government of Ningbo.
- Wenyi Fang, Master graduated in 2016, Best master graduate award, IIS, Tsinghua. First job: Management trainee at China construction bank.
- Suiqian Luo, Master graduated in 2016. First job: analyst at Credit-Ease.
- Yicheng Liu, Master graduated in 2017 Microsoft Fellowship Nomination Award. First job: research scientist, Airbnb.

## Student achievements

- Song Zuo. Google PhD Fellowship. 30 students worldwide. 2017
- Qingpeng Cai, National scholarship, Tsinghua University 2016
- Wang Zihe, Graduate student, National scholarship, Tsinghua University 2015
- Liu Yicheng, Microsoft Fellowship Nomination Award 2014
- Liu Yicheng, Graduate student, National scholarship, Tsinghua University 2014
- Wang Junxing, undergraduate student, ACM EC best student paper 2014
- Wang Junxing, Undergraduate student, National Scholarship, Tsinghua University 2013
- Liu Qipeng, Yao Class student, National Scholarship, Tsinghua University 2013

## Research Grants

- PI: Alibaba Innovative research grant, A buyer impression allocation framework via reinforcement mechanism design. 600,000 CNY. 2018
- PI: NSFC-ISF (Israel) grant, Information brokers in multi-agent systems and mechanism design. 2,000,000 CNY (Israel PI: David Sarne). 2015-2018
- PI: NSFC grant: Optimal mechanism design. 250,000 CNY. 2014-2016
- PI: Tsinghua initiative scientific program: Optimal mechanism design: two computational approaches. 430,000 CNY. 2014-2016
- Package leader: NSFC-Denmark (Aarhus) grant. Interactive computing. 2,000,000 CNY (China side alone). PI: Andrew C. Yao 2014-2016
- Package leader: China-Netherlands (University of Amsterdam) joint grant. PI: Fenrong Liu 2014-2018

## Professional Service

- Organizer
  - Workshop on Algorithmic Mechanism Design. IIIS, Tsinghua. June 2014
  - Workshop on New Trend on Mechanism Design II, Denmark, June 2013
- (Senior) Program Committee member of
  - AAAI-2012, 2013, 2014, 2015, 2016
  - AAMAS-2012, 2013, 2014, 2015, 2016
  - IJCAI-2011, 2013, 2015, 2016, 2017, 2018
  - UAI -2014
  - ACM EC -2016, 2017
  - WINE -2016
- Service at IIIS, Tsinghua
  - Head, Teaching evaluation committee
  - Member, Graduate research and study committee
  - Member, Tsinghua - Alibaba Fintech lab

## Publication List

Papers available on <http://iiis.tsinghua.edu.cn/~kenshin/>.

### Journal papers

- Unit-sphere games. Pingzhong Tang and Hanrui Zhang. *International Journal of Game theory*(4): 957-974 (2017).
- Optimal mechanisms with simple menus. Pingzhong Tang, Zihong Wang. *Journal of Mathematical economics* 69, 54-70. 2017.
- Efficient mechanism design for online scheduling. Xujin Chen, Xiaodong Hu, Tiejian Liu, Weidong Ma, Tao Qin, Pingzhong Tang, Changjun Wang, Bo Zheng. *Journal of AI Research* 56: 429-461 (2016),.
- Two Equivalence Results for Two-person Strict Games. Pingzhong Tang, Fangzhen Lin. *Games and Economic Behavior* 71(2): 479-486 (2011).
- Discovering Theorems in Game Theory: Two-Person Games with Unique Nash Equilibria payoff. Pingzhong Tang, Fangzhen Lin. *Artificial Intelligence*. 2011.
- Designing Competition between Teams of Individuals. Pingzhong Tang, Yoav Shoham, Fangzhen Lin. *Artificial Intelligence* 175(14-15): 2010-2020 (2011).
- Computer Aided Proofs of Arrow's and Other Impossibility Theorems. Pingzhong Tang, Fangzhen Lin. *Artificial Intelligence* 174(11): 749-766 (2010).

### Economics working papers

- Non-clairvoyant dynamic mechanism design. Vahab Mirrokni, Renato Paes Leme, Pingzhong Tang, Song Zuo). *Revised and Resubmitted to Econometrica*. [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2873701](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2873701)
- Reinforcement mechanism design, with applications to dynamic reserve pricing in sponsored search auctions. Working paper. <https://arxiv.org/pdf/1711.10279.pdf>
- How to evaluate (manipulate) truthful prior-dependent mechanisms. Pingzhong Tang and Yulong Zeng. *ACM EC-16 workshop on AGT and Data Science*. <http://arxiv.org/pdf/1606.02409v1.pdf>
- Optimal dynamic mechanisms with ex-post IR via bank accounts. Vahab Mirrokni, Renato Paes Leme, Pingzhong Tang Song Zuo. *ACM EC-16 AdAuction workshop*. <http://arxiv.org/pdf/1605.08840v1.pdf>

### Survey articles in Chinese

- Economics and Computation, a survey. Pingzhong Tang. *Communication of CCF*. 2017.
- Review of the AAMAS-2016 conference. Bo An, Pingzhong Tang. *Communication of CCF*. 2016
- Computational economics and optimal mechanism design. Pingzhong Tang. *Communication of CCF. Special issue on algorithmic game theory*, 2013.

### Papers in conference proceedings

- A Closed-Form Characterization of Buyer Signaling Schemes in Monopoly Pricing. Weiran Shen, Pingzhong Tang, Yulong Zeng, *AAMAS 2018*. Accepted, to appear
- Coalitional Permutation Manipulations in the Gale-Shapley Algorithm. Yuan Deng, Weiran Shen, Pingzhong Tang, *AAMAS 2018*. Accepted, to appear.
- Buyer-optimal distribution. Weiran Shen, Pingzhong Tang, Yulong Zeng, *AAMAS 2018*. Accepted, to appear.

- Ranking mechanism design for price-setting agents in e-commerce. Qingpeng Cai, Pingzhong Tang, Yulong Zeng. AAMAS, 2018. Accepted, to appear.
- Balanced outcomes in wage bargaining. Dingli Yu, Pingzhong Tang. AAMAS, 2018, extended abstract. Accepted, to appear.
- Reinforcement mechanism design for e-commerce. Qingpeng Cai, Aris-Filos Ratzikas, Pingzhong Tang, Yiwei Zhang. WWW-2018. April, Lyon, France. Accepted, to appear.
- Reinforcement mechanism design for fraudulent behavior in e-commerce. Qingpeng Cai, Aris-Filos Ratzikas, Pingzhong Tang. AAAI-2018. February. 2018. New Orleans. Accepted, to appear.
- Coalition manipulations of the Gale-Shapley algorithm. Yuan Deng, Weiran Shen, Pingzhong Tang. AAAI-2018. February 2018. New Orleans. Accepted, to appear.
- Reinforcement mechanism design. Pingzhong Tang. IJCAI-2017. August, 2017, Melbourne, Australia.
- Efficient mechanism design for online scheduling (Extended abstract). Xujin Chen, Xiaodong Hu, Tie-Yan Liu, Weidong Ma, Tao Qin, Pingzhong Tang, Changjun Wang, Bo Zheng. IJCAI-2017. August, 2017, Melbourne, Australia.
- Practical versus optimal mechanisms. Weiran Shen, Pingzhong Tang, AAMAS-2017. May, 2017, San Paulo, Brasil.
- Efficient near-optimal algorithms for barter exchange. Zhipeng Jia, Pingzhong Tang, Ruosong Wang, Hanrui Zhang. AAMAS-2017. May, 2017, San Paulo, Brasil.
- Stability of generalized two-sided markets with transaction thresholds. Wei Zhan, Zhiyuan Li, Pingzhong Tang, Yicheng Liu. AAMAS-2017. May, 2017, San Paulo, Brasil.
- K-memory strategies in repeated games. Lijie Chen, Fangzhen Lin, Pingzhong Tang, Kangning Wang, Shiheng Wang, Ruosong Wang. AAMAS-2017. May, 2017, San Paulo, Brasil.
- Fans economy and all-pay auctions with proportional allocations. Pingzhong Tang Yulong Zeng, Song Zuo. AAAI-2017.
- Bounded rationality of restricted Turing machines. Lijie Chen, Pingzhong Tang, Ruosong Wang, AAAI-2017.
- Computational issues in time-inconsistent planning. Pingzhong Tang Yifeng Teng, Zihong Wang, Shengke Xiao, Yichong Xu. AAAI-2017.
- Optimal commitments in auctions with incomplete information. Pingzhong Tang, Zihong Wang, Michael Zhang, ACM EC-2016. Neitherslands. *under submission to Econometrica*
- Optimal auctions for negatively correlated items. Pingzhong Tang and Zihong Wang, ACM EC-2016. Neitherslands.
- Dynamic auctions with bank accounts. Vahab Mirrokni, Renato Paes Leme, Pingzhong Tang, Song Zuo. IJCAI -2016.
- Digital good exchanges. Wenyi Fang, Pingzhong Tang, Song Zuo. IJCAI -2016.
- Facility location with minimax envy. Qingpeng Cai, Aris-Filos Ratsikas, Pingzhong Tang. IJCAI -2016.
- Mechanism design for personalized recommender systems. Qingpeng Cai, Aris-Filos Ratsikas, Chang Liu, Pingzhong Tang. ACM Recsys-2016. *Oral, top 10%*

- Efficient mechanism design for online scheduling. Xu jin Chen, Xiaodong Hu, Tie-Yan Liu, Weidong Ma, Tao Qin, Pingzhong Tang, Changjun Wang, Bo Zheng. *Journal of AI Research (JAIR)*. 2016.
- Complexity and algorithms of K-implementation. Yuan Deng, Pingzhong Tang, Shuran Zheng. *AAMAS-2016*.
- On the power of dominated players in team competitions. Kai Jin, Pingzhong Tang, Shiteng Chen. *AAMAS-2016*.
- Online non-preemptive story scheduling in web advertising. Tie-Yan Liu, Weidong Ma, Tao Qin, Pingzhong Tang, Guang Yang, Bo Zheng. *AAMAS-2016*,
- Digital good exchange. Wenyi Fang, Pingzhong Tang, Song Zuo, *AAMAS-2016*.
- Discrete action spaces cause little loss in single-item auctions. Yicheng Liu and Pingzhong Tang. *AAMAS-2016*.
- Optimizing trading assignments in water right markets. Yicheng Liu, Pingzhong Tang, Tingting Xu, Hang Zheng. *AAAI-2016*. Phoenix, USA.
- Optimal machine strategy to commit to in two-person repeated games. Song Zuo and Pingzhong Tang. *AAAI-2015*, Austin, USA.
- Mechanism design and implementation for lung exchange. Suiqian Luo and Pingzhong Tang, *IJCAI-2015*, uenos Aires, Argentina. (*One of the four papers covered by IJCAI media conference*)
- Optimal auctions for partially rational bidders. Zihe Wang and Pingzhong Tang, *IJCAI-2015*, Buenos Aires, Argentina.
- Bounded rationality of restricted Turing machines. Lijie Chen and Pingzhong Tang, *AAMAS-2015*, Istanbul, Turkey.
- Mechanism design for resource allocation with applications to centralized multi-commodity routing. Qipeng Liu, Yicheng Liu and Pingzhong Tang, *AAMAS-2015*, Istanbul, Turkey.
- Randomized assignments for barter exchanges: fairness vs. efficiency. Wenyi Fang, Aris Filos-Ratskas, Soren Stiil-Fredriksen, Pingzhong Tang, Song Zuo. *ADT-2015*, Kentucky, USA.
- Optimal mechanisms with simple menus. Zihe Wang and Pingzhong Tang, *ACM EC-2014*. Palo Alto, USA.
- Internally stable matchings and exchanges. Yicheng Liu, Pingzhong Tang and Wenyi Fang. *AAAI-2014*. Qubec City, Canada.
- Mechanism design for route allocation in multiple-commodity network. Qipeng Liu, Yicheng Liu and Pingzhong Tang. *AAMAS-2014*. Paris, France.
- Egalitarian pairwise kidney exchange: fast algorithms via linear programming and parametric flow. Jian Li, Yicheng Liu, Lingxiao Huang and Pingzhong Tang. *AAMAS-2014*. Paris, France.
- The multi-shop ski rental problem. Lingqing Ai, Xian Wu, Lingxiao Huang, Longbo Huang, Pingzhong Tang and Jian Li. *ACM Sigmetrics-2014*. Austin, USA.
- Bayesian vote manipulation: optimal strategies and impact on welfare. Tyler Lu, Pingzhong Tang, Ariel Procaccia, Craig Boutilier. *UAI-2012*, Catalina Island, 2012, USA.
- Optimal auctions for spiteful bidders. Pingzhong Tang, Tuomas Sandholm. *AAAI-2012*, July, 2012, Toronto, Canada.

- Mixed Bundling Auctions with Reserve Prices. Pingzhong Tang, Tuomas Sandholm. AAMAS-2012, June, 2012, Valencia, Spain.
- Approximating optimal combinatorial auctions for complements using restricted welfare maximization. Pingzhong Tang, Tuomas Sandholm. IJCAI-2011, July, 2011, Barcelona, Spain.
- Discovering Theorems in Game Theory: Two-Person Games with Unique Nash Equilibria payoff. Pingzhong Tang, Fangzhen Lin. IJCAI-2009, July, 2009, Pasadena, CA.
- Team Competition. Pingzhong Tang, Yoav Shoham, Fangzhen Lin. In AAMAS-2009, May, 2009, Budapest.
- A Framework for Quantitative Evaluation of Voting Rules. Mike Munie, Pingzhong Tang, Yoav Shoham. Logic, Game Theory and Social Choice 6, August, 2009, Ibaraki. Japan.
- Computer Aided Proofs of Arrow's and Other Impossibility Theorems. Fangzhen Lin, Pingzhong Tang. AAI-2008, July, 2008, Chicago. *Top 5% paper*

### Current Students

- Song Zuo. PhD 5th Year.
  - dynamic mechanism design and applications to online advertising
  - Google PhD fellowship, 2017, 30 student worldwide each year
- Yulong Zeng. PhD 5th Year.
  - Revenue optimal auctions, the price of prior dependence
- Weiran Shen. PhD 4th Year.
  - dynamic reserve pricing and reinforcement mechanism design
- Qingpeng Cai. PhD 4th Year.
  - mechanism design in e-commerce and reinforcement mechanism design
- Shenke Xiao. PhD 3rd Year.
  - Time-inconsistent planning, behavior economics
- Mengjing Chen. PhD 2nd Year.
  - sharing economy and ride sharing

### Referees

The referees are listed according to alphabetical order.

- Craig Boutilier, Professor of computer science, University of Toronto; Principal scientist, Google. [cboutilier@google.com](mailto:cboutilier@google.com)
- Yiling Chen, Gordon McKay professor of Computer science, Harvard University. [yiling@seas.harvard.edu](mailto:yiling@seas.harvard.edu)
- Vince Conitzer, Kimberly J. Jenkins University Professor, Duke university, [conitzer@cs.duke.edu](mailto:conitzer@cs.duke.edu)
- Xiaotie Deng, Zhiyuan Chair Professor, Shanghai Jiaotong University, [deng-xt@cs.sjtu.edu.cn](mailto:deng-xt@cs.sjtu.edu.cn)
- Edith Elkind, Professor of Computing science, Oxford University, [elkind@cs.ox.ac.uk](mailto:elkind@cs.ox.ac.uk)
- Vahab Mirrokni, Principal research scientist, head of the algorithm research, Google Research. [mirrokni@google.com](mailto:mirrokni@google.com)

- David Parkes, George F. Colony Professor, Area Dean of Computer Science, Harvard University. [parkes@eecs.harvard.edu](mailto:parkes@eecs.harvard.edu)
- Ariel Procaccia, Associate professor of computer science, Carnegie Mellon University, [arielpro@cs.cmu.edu](mailto:arielpro@cs.cmu.edu)
- Tuomas Sandholm, Professor of Computer Science, Carnegie Mellon University. [sandholm@cs.cmu.edu](mailto:sandholm@cs.cmu.edu)
- Yoav Shoham, Professor of Computer Science, Stanford University; Principal research scientist, Google. [shoham@stanford.edu](mailto:shoham@stanford.edu)
- Milind Tambe, Helen N. and Emmett H. Jones Professor in Engineering, University of Southern California, [tambe@usc.edu](mailto:tambe@usc.edu)