Juntao WANG

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Research Interest

Game theory applications, Mechanism design, Market equilibrium, Intersections of game theory and learning

Education

Shanghai Jiao Tong University, Shanghai, China *Sept. 2015 - Mar. 2017(expected)*
M.S. in Computer Science, supervised by Prof. Xiaotie Deng, GPA: 3.7/4.0

Shanghai Jiao Tong University, Shanghai, China *Sept. 2010 - June 2014*
B.S. in Computer Science (with honors), GPA: **Core:** 93.5/100(rank 1/130) **Overall:** 89.6/100(rank 3/130)

Paper and Patent

[1] **J. T. Wang**, X. Xiao, J. P. Wang, et al, "**When Group-buying Meets Cloud Computing**", in *IEEE Conference on Computer Communication (INFOCOM)*, 2016.

[2] X. T. Deng, J. P. Wang, **J. T. Wang**, et al, "**How to Design a Common Telecom Infrastructure by Competitors Individually Rational and Collectively Optimal**", in *IEEE Conference on Computer Communication (INFOCOM) workshops*, 2015.

[3] Z. Z. Zhe, **J. T. Wang**, F. Wu, et al, "**SAIL: A Strategy-Proof Auction Mechanism for Cooperative Communication**", in *IEEE International Conference on Parallel and Distributed Systems (ICPADS)*, 2013.

[4] X. T. Deng, J. P. Wang, **J. T. Wang**, et al, "**How to Design a Common Telecom Infrastructure by Competitors Individually Rational and Collectively Optimal**", in *IEEE Journal on Selected Areas, special issue on game theory on networks*, submitted.

[5] W. Qi, **J. T. Wang**, D. H. Yi, et al, "**A Game-theoretic Solution to Mitigate Cross-VM Covert Channels in Clouds**", in *IEEE Transaction on Cloud Computing*, submitted.

[6] Patent: PCT/CN2016/085713, **Mitigation of Cross-VM Covert Channel**, 14 Jun 2016, submitted.

Research Experience

Auction Mechanism Competition
Research Assistant in Shanghai Jiao Tong University *Apr. 2016 - Present*

- Proved that in position auction settings, GSP is equivalent to VCG for two competing auctioneers at equilibrium.
- Built up with java an experiment platform where the user can specify the bidders' distribution and the auctioneers' mechanisms (VCG, GSP, Myerson's optimal auction) and observe the equilibrium strategy profile of bidders.
- By utilizing the experiment platform, showed that VCG and GSP outperform Myerson's optimal auction in competition when the number of bidders is limited, otherwise, Myerson's auction is optimal.
- Showed experimentally that in Bayesian setting, if two competing auctioneers, selling an identical item by second price auction with reserve price, adopt Exp3 no-regret learning algorithm, the reserve price will approach to mixed Nash equilibrium with time.

Joint Venture Pricing and Sharing Schemes for Telecom Oligopoly
Research Assistant in Shanghai Jiao Tong University *Apr. 2014 - Aug. 2014 & June 2016 - Present*

- Explored the sharing and pricing schemes of a telecom infrastructure joint venture to manipulate the pricing strategy of rational downstream operators, which also share the joint venture, to achieve social optimality or budget balance.
- Discovered the potential prisoners' dilemma laying in this new business practice and revealed how it could be overcome by pooling each agent's resources together and then renting resources back to the same pool of agents.

A Game-theoretic Solution to Mitigate Cross-VM Covert Channels in Clouds
Research Assistant in City University of Hong Kong *Aug. 2015 - May 2016*

- Modeled and formulated the covert channel attack problem as a game running in continuous time horizon.
- Theoretically reduced the real-time covert channel attack and defense game to a one-shot bi-matrix game and improved 60% of the defense efficiency with reduced system overhead.

Group-buying Strategies and Equilibriums in Cloud Market
Research Assistant in City University of Hong Kong *Feb. 2015 - Sept. 2015*

- Conducted a comprehensive survey of cooperative game and mastered the main stability concepts, revenue sharing mechanism, and algorithms to derive the stable outcomes, such as Shapley value, core, and nucleus.
- Proposed a new stability concept that complements the existing ones and refined the algorithm used in a number of cooperative game settings to improve the stability of the game outcome without sacrificing too much time efficiency.
- Analyzed the stability of group-buying problem in cloud market, designed algorithms to achieve stable outcome with experimentally 0.85 approximate ratio to the intractable optimal stable solution.

Strategy-Proof Auction Mechanisms for Cooperative Communication
Research Assistant in Shanghai Jiao Tong University *Jan. 2013 - June 2013*

- Extended the single-mind auction to multi-mind uniform valuation auction.
- Showed the approximate ratio of the new auction and solved out the cooperative relay problem.

Teaching Assistant Experience

Graduate Course - Big Data Algorithms and Analysis
Teaching Assistant in Shanghai Jiao Tong University *Sept. 2016 - Present*

- Assisted students in learning linear median algorithm, shortest path algorithms in big graphs, fast convex hall algorithms, incomputability of Kolmogorov complexity, etc, answered corresponding questions and designed tests.

Graduate Course - Internet Economics and Mechanism Design
Teaching Assistant in Shanghai Jiao Tong University *Mar. 2014 - June 2014 & Mar. 2016 - June 2016*

- Mastered market equilibrium and envy-free solutions in position auction, VCG, GSP, Myerson's optimal auction, matching market, PoA, etc, answered corresponding questions and designed tests.

Undergraduate Course - Computability Theory
Teaching Assistant in Shanghai Jiao Tong University *Sept. 2013 - Jan. 2014*

- Mastered Church-Turing thesis, halting problem, and Cantors diagonalization method, made lecture notes, answered corresponding questions and designed tests.

Selected Award

National Scholarship of China *2016*
Google Scholarship China *2015*
Excellent Graduate Award, Shanghai Jiao Tong University *2014*
Google Scholarship China *2013*
The First Prize, National Olympiad in Informatics in Provinces *2009*

Skill

Programming languages: C/C++, Matlab, Java, python, pascal, Mathematica, LaTeX