Zhiwei Steven Wu

Contact Information

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Research Interests

Data Privacy, Machine Learning, Algorithmic Economics

Education

University of Pennsylvania, Philadelphia, Pennsylvania USA

Ph.D. Candidate, Computer Science — September 2012 – Present
- Advisors: Michael Kearns & Aaron Roth

Bard College, Annandale, NY USA

B.A., Mathematics — May 2012
B.A., Computer Science — May 2012
Distinguished Scientist Scholarship (four-year full scholarship)
Overall GPA: 3.92/4.0

Budapest Semesters in Mathematics (BSM), Budapest, Hungary

Study-abroad program in mathematics — Fall 2010

Work Experiences

Microsoft Research, New York, NY

PhD research intern — Summer 2015, Spring 2016
Supervisor: Alex Slivkins

Microsoft Research, Cambridge, MA

PhD research intern — Summer 2016
Supervisor: Robert Kleinberg

Teaching Experiences

University of Pennsylvania, Philadelphia, PA

Teaching Assistant — Fall 2013, Spring 2014
- NETS-412 Algorithmic Game Theory
- CIS-320 Introduction to Algorithms

Bard College, Annandale, NY

Teaching Assistant — Spring 2009 – Fall 2011
- Math 322 Operations Research
- Math 213 Linear Algebra with Ordinary Differential Equations
- Math 142 Calculus II

Bard Prison Initiative, Eastern Correctional Facility, NY

Teaching Fellow: gave math tutorials to inmates — Spring 2011

Professional Services

Reviewer: SODA 2017, COLT 2016, ESA 2016, TEAC, WINE 2015, ISAAC 2015, NIPS 2015, FOCS 2015, STOC 2015, FOCS 2014, WINE 2014, WINE 2013

Journal Publications

(Authors in all publications are in alphabetical order)

- Michael Kearns, Aaron Roth, Zhiwei Steven Wu, and Grigory Yaroslavtsev. Private algorithms for the protected in social network search. *Proceedings of the National Academy of Sciences* (**PNAS**), 113(4), 2016
- Justin Hsu, Zhiyi Huang, Aaron Roth, Tim Roughgarden, and Zhiwei Steven Wu. Private matchings and allocations. *SIAM Journal on Computing* (**SICOMP**), 2016. To appear. Previously published in ACM SIGACT Symposium on Theory of Computing (STOC 2014)
- Marco Gaboardi, Emilio Jesús Gallego Arias, Justin Hsu, Aaron Roth, and Zhiwei Steven Wu. Dual query: Practical private query release for high dimensional data. *Journal of Privacy and Confidentiality* (**JPC**), 2016. To appear. Previously published in International Conference on Machine Learning (ICML 2014)

Conference Publications

- Shahin Jabbari, Ryan Rogers, Aaron Roth, and Zhiwei Steven Wu. Learning from rational behavior: Predicting solutions to unknown linear programs. In *Advances in Neural Information Processing Systems 28: Annual Conference on Neural Information Processing Systems* **NIPS**, 2016
- Yishay Mansour, Aleksandrs Slivkins, Vasilis Syrgkanis, and Zhiwei Steven Wu. Bayesian exploration: Incentivizing exploration in bayesian games. In *Proceedings of the 2016 ACM Conference on Economics and Computation,* **EC**, 2016. Invited to the special issue of ACM Transactions on Economics and Computation (declined)
- Aaron Roth, Jonathan Ullman, and Zhiwei Steven Wu. Watch and learn: optimizing from revealed preferences feedback. In *Proceedings of the 48th Annual ACM SIGACT Symposium on Theory of Computing,* **STOC**, 2016
- Rachel Cummings, Katrina Ligett, Kobbi Nissim, Aaron Roth, and Zhiwei Steven Wu. Adaptive learning with robust generalization guarantees. In *Proceedings of the 29th Conference on Learning Theory,* **COLT**, 2016
- Paul W. Goldberg, Francisco J. Marmolejo Cossío, and Zhiwei Steven Wu. Logarithmic query complexity for approximate nash computation in large games. In *Proceedings of the 9th International Symposium on Algorithmic Game Theory,* **SAGT**, 2016. Invited to the special issue of Theory of Computing Systems
- Justin Hsu, Zhiyi Huang, Aaron Roth, and Zhiwei Steven Wu. Jointly private convex programming. In *Proceedings of the Twenty-Seventh Annual ACM-SIAM Symposium on Discrete Algorithms,* **SODA**, 2016
- Rachel Cummings, Katrina Ligett, Jaikumar Radhakrishnan, Aaron Roth, and Zhiwei Steven Wu. Coordination complexity: Small information coordinating large populations. In *Proceedings of the 2016 ACM Conference on Innovations in Theoretical Computer Science,* **ITCS**, 2016
- Rachel Cummings, Michael Kearns, Aaron Roth, and Zhiwei Steven Wu. Privacy and truthful equilibrium selection for aggregative games. In *Proceedings of the 11th International Conference on Web and Internet Economics,* **WINE**, 2015
- Ryan Rogers, Aaron Roth, Jonathan Ullman, and Zhiwei Steven Wu. Inducing approximately optimal flow using truthful mediators. In *Proceedings of the Sixteenth ACM Conference on Economics and Computation,* **EC**, 2015
- Rachel Cummings, Katrina Ligett, Aaron Roth, Zhiwei Steven Wu, and Juba Ziani. Accuracy for sale: Aggregating data with a variance constraint. In *Proceedings of the 2015 Conference on Innovations in Theoretical Computer Science,* **ITCS**, 2015

- Sampath Kannan, Jamie Morgenstern, Aaron Roth, and Zhiwei Steven Wu. Approximately stable, school optimal, and student-truthful many-to-one matchings (via differential privacy). In *Proceedings of the Twenty-Sixth Annual ACM-SIAM Symposium on Discrete Algorithms,* **SODA**, 2015

- Marco Gaboardi, Emilio Jesús Gallego Arias, Justin Hsu, Aaron Roth, and Zhiwei Steven Wu. Dual query: Practical private query release for high dimensional data. In *Proceedings of the 31th International Conference on Machine Learning,* **ICML**, 2014

- Justin Hsu, Zhiyi Huang, Aaron Roth, Tim Roughgarden, and Zhiwei Steven Wu. Private matchings and allocations. In *Proceedings of the 46th ACM Symposium on Theory of Computing,* **STOC**, 2014. Invited to the special issue of ACM Transactions on Economics and Computation (declined)

Drafts

- Aaron Roth, Aleksandrs Slivkins, Jonathan Ullman, and Zhiwei Steven Wu. Multidimensional dynamic pricing for welfare maximization. *Manuscript*, 2016

- Yishay Mansour, Aleksandrs Slivkins, and Zhiwei Steven Wu. Competing bandits: Learning under competition. *Manuscript*, 2016

- Michael Kearns and Zhiwei Steven Wu. Composition of learning models: Predicting with distributions. *Manuscript*, 2016

- Michael Kearns, Aaron Roth, and Zhiwei Steven Wu. Meritocratic Fairness for Cross-Population Selection *Manuscript*, 2017

- Sampath Kannan, Michael Kearns, Jamie Morgenstern, Mallesh Pai, Aaron Roth, Rakesh Vohra, and Zhiwei Steven Wu. Incentivizing Fairness in Myopic Agents *Manuscript*, 2017

Surveys/ Newsletters

- Aaron Roth, Jonathan Ullman, and Zhiwei Steven Wu. Watch and learn: optimizing from revealed preferences feedback. *SIGecom Exchanges*, 2015

Honors and Awards

Simons-Berkeley Research Fellowship (declined)
Doctoral Fellowship, University of Pennsylvania, 2012 –
Kenneth Bush Memorial Scholarship in Mathematics, 2011
BSM Mathematics Competition Honorable Mention, 2010
Mathematical Association of America Presentation Prize Winner, 2010
Distinguished Scientist Scholarship (DSS): four-year full scholarship, 2008 – 2012
DSS Summer Research Grant: 2009, 2010

Selected Talks

Protecting People from Algorithms (and Vice Versa)
- Microsoft Research–New York City, Jan 2017
- Microsoft Research–Redmond, Jan 2017
- Microsoft Research–New England, Feb 2017

Tutorial on Differential Privacy
- Muhlenberg College Math/CS Colloquium, May 2017

Leveraging No-Regret Algorithms in Private Data Analysis
- Princeton CS theory lunch, Feb 2017

Social Norms for Data-Driven Algorithms: Privacy, Incentive-Compatibility and Fairness
- SIGAI CNC, Boston, MA, Oct 2016
- NY Area Theory Day, New York, NY, Dec 2016

Adaptive Data Analysis and Differential Privacy

- Guest Lecture in the course Computational Learning Theory at UPenn

Adaptive Learning with Robust Generalization Guarantees
- COLT, New York City, June 2016

Coordination Complexity: Small Information Coordinating Large Populations
- Northeastern University Theory Seminar, January 2016
- UPenn Theory Lunch, September 2015
- University of Hong Kong, Theory Seminar, December 2015

Bayesian Exploration: Incentivizing Exploration in Bayesian Games
- Harvard EconCS Seminar, September 2016
- EC, Maastricht, July 2016
- Microsoft Research NYC Tea Talk, July 2015

Watch and Learn: Optimizing from Revealed Preferences Feedback
- STOC, Cambridge, June 2016
- Caltech Theory Lunch, April 2015
- The First Workshop on Algorithmic Game Theory and Data Science, Portland, June 2015

Inducing Approximately Optimal Flow Using Truthful Mediators
- EC, Portland, June 2015

Privacy for the Protected (Only)
- Columbia CS Seminar, Dec. 2016
- Cornell Theory Seminar, Nov. 2016
- Workshop on The Theory of Bringing Privacy into Practice, Pasadena, April 2015

Privacy and Truthful Equilibrium Selection in Aggregative Games
- UPenn Theory Lunch, September 2014
- WINE, December 2015

Dual Query: Practical Private Query Release for High Dimensional Data
- ICML, Beijing, June 2014

Private Matchings and Allocations
- STOC, New York, June 2014
- UPenn Theory Lunch, May 2014

Undergraduate Research/Work Experiences

Gambit, New York, NY
Software developer for Game Theory Explorer Summer 2011
Supervisor: Bernhard von Stengel

DIMACS, Piscataway, NJ
Researcher on Graph Theory Summer 2010
Mentor: Eugene Fiorini

NSF Math Research Experiences for Undergraduates, College Station, TX
Researcher on Wavelet Theory at Texas A&M University Summer 2009
Mentor: David Larson