Jason D. Hartline

Computer Science
Northwestern University
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Research Interests

Economics. Mechanism design, auction theory, microeconomics, economic theory, econometrics.

Computer Science. Algorithmic mechanism design, algorithmic game theory, machine learning theory, algorithms, data science.

Education

Ph.D. in Computer Science. University of Washington, Seattle, WA. *Summer 2003*
Thesis: *Optimization in the Private Value Model: Competitive Analysis Applied to Auction Design*
Advisor: Anna Karlin.

M.S. in Computer Science. University of Washington, Seattle, WA. *Spring 2000*

B.S. in Computer Science. Cornell University, Ithaca, NY. *Spring 1997*

B.S. in Electrical Engineering. Cornell University, Ithaca, NY. *Spring 1997*

Current Appointment

Associate Professor. Northwestern U., Evanston, IL. *Fall 2012 – present*
Electrical Engineering and Computer Science Department, McCormick School of Engineering; Managerial Economics and Decision Sciences Department, Kellogg School of Management (courtesy); and Department of Economics, Wienberg School of Arts and Sciences (courtesy).

Previous Appointments

Visiting Researcher. Microsoft Research, Cambridge, MA. *Spring 2015*

Visiting Professor. Harvard U., Cambridge, MA. *2014*
Computer Science and Economics departments.

Assistant Professor. Northwestern U., Evanston, IL. *2008 – 2012*
Electrical Engineering and Computer Science Department, McCormick School of Engineering and Managerial Economics and Decision Sciences Department, Kellogg School of Management (courtesy).

Previous Appointments (cont.)

Researcher. Microsoft Research, Mountain View, CA. *2004 – 2007*
Research Area: Algorithmic Mechanism Design, Auction Theory, Pricing Algorithms, Auctions for Sponsored Search.

Post-doctoral Research Fellow. ALADDIN, Carnegie Mellon U., Pittsburgh, PA. *Fall 2003*
Research Area: Mechanism Design.
Supervisor: Avrim Blum.

Mentoring

Ph.D. Advisees. *current*
Yiding Feng, Aleck Johnsen, and Michalis Mamakos.

Former Students. *since 2009*
Bach Ha (Microsoft), Nima Haghpanah (Penn State, Asst. Prof.), Darrell Hoy (Tremmor Technologies), and Samuel Taggart (Oberlin, Asst. Prof.)

Post-doctoral Fellows. *since 2006*
Liad BLumrosen (Hebrew U.) and Azarakhsh Malekian (Toronto, Asst. Prof.)

Former Summer Students. *since 2004*
Gagan Aggarwal, Abraham Flaxman, Ning Chen, Mukund Sundararajan, Benjamin Prosnitz, Matthew Burgess, Saeed Alaei, Hu Fu, and Shweta Jain.

Service

Program Committee. ACM Conference on Electronic Commerce. *2005, 2006, 2008–present*

Coorganizer. Special Quarter on Online Markets and Data Science. *Spring 2018*
with Jacob Abernethy, Constantinos Daskalakis, and Denis Nekipelov.

Special Initiatives Chair. ACM Special Interest Group on E-commerce. *2014–2015*
on the Academic Job Market.

Guest Editor. Games and Economic Behavior. *2011–2014*
special issues for papers from STOC, FOCS, and SODA conferences.

Advisory Editor. Games and Economic Behavior. *2012–2017*

Associate Editor. Operations Research Letters. *2012–2017*

Co-organizer. New York Computer science and Economics (NYCE) Day. *2013*

Co-organizer. FOCS Workshop on Bayesian Mechanism Design. *2012*

Program Committee. Symposium on Theory of Computation. *2012*

Program Committee. ACM Symposium on Theory of Computating. *2012*

Co-organizer. Workshop on Bayesian Mechanism Design. *2011*

Service (cont.)

Co-organizer. Greece Economic and Algorithmic Theory Week. *2011*

Co-organizer. Bertinoro Workshop on Algorithmic Game Theory. *2006, 2010*

Tutorials Chair. ACM Conference on Electronic Commerce. *2010*

Local Arrangements. ACM Conference on Electronic Commerce. *2008*

Organizer. Midwest Theory Day. *2008*

Program Committee. ACM-SIAM Symposium on Discrete Algorithms. *2007*

Co-organizer. Bay Algorithmic Game Theory Symposium (biannual). *2006–2007*

Co-organizer. Workshop on Sponsored Search Auctions. *2006*

Co-organizer. Alternative Solution Concepts in Mechanism Design. *2006*

Co-organizer. ALADDIN Workshop on Auction Theory & Practice. *2003*

Awards, Fellowships, and Grants

NSF Collaborative Research. Peer Grading *2017*
with Douglas Downey and Eleanor O'Rourke.

NSF Award. Non-revelation Mechanism Design *2016*

Teacher of the Year. EECS Dept., Northwestern U. *2010–2011*

NSF Collaborative Research. Towards Realistic Mechanisms: statistics, inference, and approximation in simple Bayes-Nash implementation *2011*
with Shuchi Chawla and Denis Nekipelov.

NSF CAREER Award. Mechanism Design. *2009*

NSF Collaborative Research. Approximation in Mechanism Design. *2008*
with Shuchi Chawla.

ALADDIN Post-doctoral Research Fellowship. Carnegie Mellon University. *2003*

Math Sciences Post-doctoral Research Fellowship. National Science Foundation. *2003*
Declined.

Microsoft Endowed Fellowship. Microsoft Corp. *2001*

Bob Bandes Teaching Award, Honorable Mention. CS Dept., U. of Washington. *1998*

Small Business Innovative Research Grant. Department of Education. *1997*

Patents

Online Pricing and Buyback. U.S. Patent #8260724 *2012*
with Moshe Babaioff and Robert Kleinberg.

Systems and Methods for Pricing and Selling Digital Goods. U.S. Patent #6985885 *2006*
with Andrew Goldberg and Andrew Wright.

Book Chapters

Profit Maximizing Mechanism Design. *Algorithmic Game Theory 2007*
with Anna Karlin; eds. Noam Nisan, Tim Roughgarden, Eva Tardos, and Vijay Vazirani.

Popular Press

Badminton and the Science of Rule Making. *Huffington Post 2012*
with Robert Kleinberg.

Working Papers

Mechanism Redesign. *2017*
with Shuchi Chawla and Denis Nekipelov.

Multi-dimensional Virtual Values and Second-degree Price Discrimination. *2014-2016*
with Nima Haghpanah.

Non-revelation Mechanism Design. *2016*
with Samuel Taggart.

Journal Papers

Optimal auctions vs. Anonymous Pricing. *GEB*[1] *2018*
with Saeed Alaei, Rad Niazadeh, Manolis Pountourakis, and Yang Yuan.

Efficient Computation of Optimal Auctions via Reduced Forms. *MOR*[2] *2018*
with Saeed Alaei, Hu Fu, Nima Haghpanah, and Azarakhsh Malekian.

Non-optimal Mechanism Design. *AER*[3] *2015*
with Brendan Lucier.

Bayesian Incentive Compatibility and Matchings. *GEB 2015*
with Robert Kleinberg and Azarakhsh Malekian. Special Issue.

[1] Games and Economic Behavior.
[2] Mathematics of Operations Research.
[3] American Economic Review.

Journal Papers (cont.)

Optimal Crowdsourcing Contests. *GEB 2015*
with Shuchi Chawla and Balu Sivan. Special Issue.

Envy freedom and prior-free mechanism design. *Journal of Economic Theory 2015*
with Nikhil Devanur and Qiqi Yan. Special issue.

Mechanism Design via Consensus Estimates, Cross Checking, and Profit Extraction. with Bach Ha. Special issue. *Transactions on Economics and Computation 2013*

Bayesian Mechanism Design. *FTTCS*[4] *2012*

Approximation in Mechanism Design. *AER 2012*

Derandomization of Auctions. *GEB 2010*
with Gagan Aggarwal, Amos Fiat, Andrew Goldberg, Nicole Immorlica, and Madhu Sudan.

Algorithms for Data Migration. with Eric Anderson, Joseph Hall, M. Hobbes, Anna Karlin, Jared Saia, Ram Swaminathan, and John Wilkes. *Algorithmica 2010*

Reducing Mechanism Design to Algorithm Design via Machine Learning. *JCSS*[5] *2008*
with Maria-Florina Balcan, Avrim Blum, and Yishay Mansour.

Competitive Auctions. *GEB 2006*
with Andrew Goldberg, Anna Karlin, Mike Saks, and Andrew Wright. Special issue.

Characterizing History Independent Data Structures. *Algorithmica 2005*
with Edwin Hong, Alexander Mohr, William Pentney, and Emily Rocke. Special issue.

Refereed Conference Papers

An End-to-end Argument in Mechanism Design (Prior-independent Auctions for Budgeted Agents). with Yiding Feng. *FOCS*[6] *2018*

Fast Core Pricing for Rich Advertising Auctions. *EC*[7] *2018*
with Nicole Immorlica, Mohammad Reza Khani, Brendan Lucier, and Rad Niazadeh.

Bernoulli Factories and Black-box Reductions in Mechanism Design. *STOC*[8] *2017*
with Shaddin Dughmi, Robert Kleinberg, and Rad Niazadeh.

Bayeesian Budget Feasibility with Posted Pricing. *WWW 2016*
with Eric Balkanski.

A/B Testing of Auctions. *EC 2016*
with Shuchi Chawla and Denis Nekipelov.

[4]Foundations and Trends in Theoretical Computer Science.
[5]Journal of Computer and System Sciences.
[6]IEEE Symposium on Foundations of Computer Science.
[7]ACM Conference on Economics and Computation.
[8]ACM Symposium on Theory of Computating.

Refereed Conference Papers (cont.)

No-regret Learning in Bayesian Games. *NIPS[9] 2015*
with Vasilis Syrgkanis and Eva Tardos.

Optimal auctions vs. Anonymous Pricing. *FOCS 2015*
with Saeed Alaei, Rad Niazadeh, Manolis Pountourakis, and Yang Yuan.

Mechanism Design for Data Science. *EC 2014*
with Shuchi Chawla and Denis Nekipelov.

Price of Anarchy for Auction Revenue. *EC 2014*
with Darrell Hoy and Samuel Taggart.

Optimal Auctions for Correlated Buyers with Sampling. *EC 2014*
with Hu Fu, Nima Haghpanah, and Robert Kleinberg.

The Simple Economics of Approximately Optimal Auctions. *FOCS 2013*
with Saeed Alaei, Hu Fu, and Nima Haghpanah.

Auctions with Unique Equilibria. *EC 2013*
with Shuchi Chawla.

Prior-independent Auctions for Risk-averse Agents. *EC 2013*
with Hu Fu and Darrell Hoy.

Prior-free Auctions for Budgeted Agents. *EC 2013*
with Nikhil Devanur and Bach Ha.

Prior-independent Mechanisms for Scheduling. *STOC 2013*
with Shuchi Chawla, David Malec, and Balu Sivan.

Mechanism Design via Multi- to Single-agent Reduction. *EC 2012*
with Saeed Alaei, Hu Fu, Nima Haghpanah, and Azarakhsh Malekian.

Optimal Crowdsourcing Contests. *SODA[10] 2012*
with Shuchi Chawla and Balu Sivan. Invited to GEB special issue.

Mechanism Design via Consensus Estimates, and Cross Checking, and Profit Extraction. with Bach Ha. Invited to TEAC special issue. *SODA 2012*

Truth, Envy, and Profit. *EC 2011*
with Qiqi Yan. Invited to JET special issue.

Bayesian Incentive Compatibility and Matchings. *SODA 2011*
with Robert Kleinberg and Azarakhsh Malekian. Invited to GEB special issue.

Bayesian Algorithmic Mechanism Design. *STOC 2010*
with Brendan Lucier.

[9] Conference on Neural Information Processing Systems.
[10] ACM-SIAM Symposium on Discrete Algorithms.

Refereed Conference Papers (cont.)

Sequential Posted Pricing and Multi-parameter Mechanism Design. *STOC 2010*
with Shuchi Chawla, David Malec, and Balasubramanian Sivan.

Simple versus Optimal Mechanisms. *EC 2009*
with Tim Roughgarden.

Limited and Online Supply and the Bayesian Foundations of Prior-free Mechanism Design. with Nikhil Devanur. *EC 2009*

Selling Ad Campaigns: Online Algorithms with Cancellations. *EC 2009*
with Moshe Babaioff and Robert Kleinberg.

Mechanism Design and Money Burning. *STOC 2008*
with Tim Roughgarden.

Optimal Marketing Strategies over Social Networks. *WWW 2008*
with Vahab Mirrokni and Mukund Sundararajan.

Auctions for Structured Procurement. *SODA 2008*
with Matthew Cary, Abraham Flaxman, and Anna Karlin.

Algorithmic Pricing via Virtual Valuations. *EC 2007*
with Shuchi Chawla and Robert Kleinberg.

Knapsack Auctions. *SODA 2006*
with Gagan Aggarwal.

Bayesian Optimal No-deficit Mechanism Design. *WINE*[11] *2006*
with Shuchi Chawla, R. Ravi, and Uday Rajan.

Mechanism Design via Machine Learning. *FOCS 2005*
with Maria-Florina Balcan, Avrim Blum, and Yishay Mansour.

Derandomization of Auctions. *STOC 2005*
with Gagan Aggarwal, Amos Fiat, Andrew Goldberg, Nicole Immorlica, and Madhu Sudan.

On Profit-Maximizing Envy-Free Pricing. *SODA 2005*
with Venkat Guruswami, Anna Karlin, David Kempe, Claire Kenyon, and Frank McSherry.

Collusion-Resistant Mechanisms for Single Parameter Agents. *SODA 2005*
with Andrew Goldberg.

Near-Optimal Online Auctions. *SODA 2005*
with Avrim Blum.

From Optimal Limited to Unlimited Supply Auctions. *EC 2005*
with Robert McGrew.

[11] International Workshop on Internet and Network Economics.

Refereed Conference Papers (cont.)

On the Competitive Ratio of the Random Sampling Auction. *WINE 2005*
with Uriel Feige, Abraham Flaxman, and Robert Kleinberg.

Near-Optimal Pricing in Near-Linear Time. *WADS*[12] *2005*
with Vladlen Koltun.

A Lower Bound on the Competitive Ratio of Truthful Auctions. *STACS*[13] *2004*
with Andrew Goldberg, Anna Karlin, and Mike Saks.

Competitiveness via Consensus. *SODA 2003*
with Andrew Goldberg.

Envy-Free Auctions for Digital Goods. *EC 2003*
with Andrew Goldberg.

Truthful and Competitive Double Auctions. *ESA*[14] *2002*
with Kaustubh Deshmukh, Andrew Goldberg, and Anna Karlin.

Competitive Generalized Auctions. *STOC 2002*
with Amos Fiat, Andrew Goldberg, and Anna Karlin.

Characterizing History Independent Data Structures. *ISAAC*[15] *2002*
with Edwin Hong, Alexander Mohr, William Pentney, and Emily Rocke.

Competitive Auctions and Digital Goods. *SODA 2001*
with Andrew Goldberg and Andrew Wright.

Competitive Auctions for Multiple Digital Goods. *ESA 2001*
with Andrew Goldberg.

On Algorithms for Efficient Data Migration. *SODA 2001*
with Joe Hall, Anna Karlin, Jared Saia, and John Wilkes.

An Experimental Study of Data Migration Algorithms. *WAE*[16] *2001*
with E. Anderson, J. Hall, M. Hobbes, A. Karlin, J. Saia, R. Swaminathan, and J. Wilkes.

[12]Workshop on Algorithms and Data Structures.
[13]Symposium on Theoretical Aspects of Computer Science.
[14]European Symposium on Algorithms.
[15]International Symposium on Algorithms and Computation.
[16]Workshop on Algorithm Engineering.