

# Jason D. Hartline

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## Research Interests

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

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

## Education

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**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

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**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

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**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.)

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- 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

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- 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

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- 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 Computing. *2012*
- Co-organizer.** Workshop on Bayesian Mechanism Design. *2011*

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**Service (cont.)**


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<b>Co-organizer.</b> Greece Economic and Algorithmic Theory Week.	2011
<b>Co-organizer.</b> Bertinoro Workshop on Algorithmic Game Theory.	2006, 2010
<b>Tutorials Chair.</b> ACM Conference on Electronic Commerce.	2010
<b>Local Arrangements.</b> ACM Conference on Electronic Commerce.	2008
<b>Organizer.</b> Midwest Theory Day.	2008
<b>Program Committee.</b> ACM-SIAM Symposium on Discrete Algorithms.	2007
<b>Co-organizer.</b> Bay Algorithmic Game Theory Symposium (biannual).	2006–2007
<b>Co-organizer.</b> Workshop on Sponsored Search Auctions.	2006
<b>Co-organizer.</b> Alternative Solution Concepts in Mechanism Design.	2006
<b>Co-organizer.</b> ALADDIN Workshop on Auction Theory & Practice.	2003

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**Awards, Fellowships, and Grants**


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<b>NSF Collaborative Research.</b> Peer Grading with Douglas Downey and Eleanor O'Rourke.	2017
<b>NSF Award.</b> Non-revelation Mechanism Design	2016
<b>Teacher of the Year.</b> EECS Dept., Northwestern U.	2010–2011
<b>NSF Collaborative Research.</b> Towards Realistic Mechanisms: statistics, inference, and approximation in simple Bayes-Nash implementation with Shuchi Chawla and Denis Nekipelov.	2011
<b>NSF CAREER Award.</b> Mechanism Design.	2009
<b>NSF Collaborative Research.</b> Approximation in Mechanism Design. with Shuchi Chawla.	2008
<b>ALADDIN Post-doctoral Research Fellowship.</b> Carnegie Mellon University.	2003
<b>Math Sciences Post-doctoral Research Fellowship.</b> National Science Foundation. Declined.	2003
<b>Microsoft Endowed Fellowship.</b> Microsoft Corp.	2001
<b>Bob Bandes Teaching Award, Honorable Mention.</b> CS Dept., U. of Washington.	1998
<b>Small Business Innovative Research Grant.</b> Department of Education.	1997

## Patents

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**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

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

## Popular Press

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

## Working Papers

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**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

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**Optimal auctions vs. Anonymous Pricing.** *GEB*<sup>1</sup> 2018  
with Saeed Alaei, Rad Niazadeh, Manolis Pountourakis, and Yang Yuan.

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

**Non-optimal Mechanism Design.** *AER*<sup>3</sup> 2015  
with Brendan Lucier.

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

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<sup>1</sup>Games and Economic Behavior.

<sup>2</sup>Mathematics of Operations Research.

<sup>3</sup>American Economic Review.

## Journal Papers (cont.)

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- 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<sup>4</sup> 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<sup>5</sup> 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

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- An End-to-end Argument in Mechanism Design (Prior-independent Auctions for Budgeted Agents).** with Yiding Feng. *FOCS<sup>6</sup> 2018*
- Fast Core Pricing for Rich Advertising Auctions.** *EC<sup>7</sup> 2018*  
with Nicole Immorlica, Mohammad Reza Khani, Brendan Lucier, and Rad Niazadeh.
- Bernoulli Factories and Black-box Reductions in Mechanism Design.** *STOC<sup>8</sup> 2017*  
with Shaddin Dughmi, Robert Kleinberg, and Rad Niazadeh.
- Bayesian Budget Feasibility with Posted Pricing.** *WWW 2016*  
with Eric Balkanski.
- A/B Testing of Auctions.** *EC 2016*  
with Shuchi Chawla and Denis Nekipelov.

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<sup>4</sup>Foundations and Trends in Theoretical Computer Science.

<sup>5</sup>Journal of Computer and System Sciences.

<sup>6</sup>IEEE Symposium on Foundations of Computer Science.

<sup>7</sup>ACM Conference on Economics and Computation.

<sup>8</sup>ACM Symposium on Theory of Computing.

## Refereed Conference Papers (cont.)

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- No-regret Learning in Bayesian Games.** *NIPS*<sup>9</sup> 2015  
with Vasilis Syrgkanis and Eva Tardos.
- Reverse Mechanism Design.** *EC* 2015  
with Nima Haghpanah.
- 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*<sup>10</sup> 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.

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<sup>9</sup>Conference on Neural Information Processing Systems.

<sup>10</sup>ACM-SIAM Symposium on Discrete Algorithms.

## Refereed Conference Papers (cont.)

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- Bayesian Algorithmic Mechanism Design.** *STOC 2010*  
with Brendan Lucier.
- 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<sup>11</sup> 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.

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<sup>11</sup>International Workshop on Internet and Network Economics.

**Refereed Conference Papers (cont.)**

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- From Optimal Limited to Unlimited Supply Auctions.** *EC 2005*  
with Robert McGrew.
- 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<sup>12</sup> 2005*  
with Vladlen Koltun.
- A Lower Bound on the Competitive Ratio of Truthful Auctions.** *STACS<sup>13</sup> 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<sup>14</sup> 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<sup>15</sup> 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<sup>16</sup> 2001*  
with E. Anderson, J. Hall, M. Hobbess, A. Karlin, J. Saia, R. Swaminathan, and J. Wilkes.

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<sup>12</sup>Workshop on Algorithms and Data Structures.

<sup>13</sup>Symposium on Theoretical Aspects of Computer Science.

<sup>14</sup>European Symposium on Algorithms.

<sup>15</sup>International Symposium on Algorithms and Computation.

<sup>16</sup>Workshop on Algorithm Engineering.