

Jason D. Hartline

Professor of Computer Science
Northwestern University
Evanston, IL 60208.
hartline@northwestern.edu
<https://jasonhartline.com/>
+1 (415) 200-6171

Research Interests

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

Law. Algorithmic law, accountability.

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

Professor. Northwestern U., Evanston, IL. *Fall 2019 – present*
Department of Computer Science, 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).

Cofounder. Virtual Chair Inc., Chicago IL. *Summer 2020 – Current*

Previous Appointments

Associate Professor. Northwestern U., Evanston, IL. *Fall 2012 – Summer 2019*
Department of Computer Science, 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).

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. *Winter 2008 – Summer 2012*
Electrical Engineering and Computer Science Department, McCormick School of Engineering and
Managerial Economics and Decision Sciences Department, Kellogg School of Management (courtesy).

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*
 Sheng Long, Michalis Mamakos, Anant Shah, Matthiew vonAllmen, Yifan Wu, Chenhao Zhang.

Former Students. *since 2009*
 Modibo Camara (Stanford), Yingkai Li (Yale), Yiding Feng (Microsoft Research), Bach Ha (Microsoft), Aleck Johnsen, Nima Haghpanah (Penn State, Asst. Prof.), Darrell Hoy (Carta), and Samuel Taggart (Oberlin, Asst. Prof.)

Post-doctoral Fellows. *since 2006*
 Jinshuo Dong, Hedyeh Beyhaghi (CMU), Liad Blumrosen (Hebrew U.), Azarakhsh Malekian (Toronto)

Short-term Students. *since 2004*
 Gagan Aggarwal, Abraham Flaxman, Ning Chen, Mukund Sundararajan, Benjamin Prosnitz, Matthew Burgess, Saeed Alaei, Hu Fu, Shweta Jain, Rad Niazadeh, Sarah Lim, Sadie Hood.

Service

Program Chair. ACM Conference on Electronic Commerce. *2023*

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

Associate Editor. Journal of Economic Theory *2019 – present*

Co-organizer. Northwestern CS+Econ Quarterly Workshop *2018 – present*

Co-organizer. Northwestern Quarterly Theory Workshop *2016 – present*

General Chair. ACM Conference on Electronic Commerce. *2020*

Co-organizer. 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. *2011 – 2014*

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

Co-organizer. FOCS Workshop on Bayesian Mechanism Design. *2014*

Program Committee. Symposium on Theory of Computation	2012
Co-organizer. Workshop on Bayesian Mechanism Design	2011
Co-organizer. Greece Economic and Algorithmic Theory Week.	2011, 2014
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 AF. Mechanism Design for the Classroom	2022
European Symposium on Algorithms Test of Time. with Andrew Goldberg for “Competitive Auctions and Multiple Digital Goods” from ESA 2021.	2021
SIGecom Test of Time. with Andrew Goldberg and Andrew Wright for “Competitive Auctions and Digital Goods” from SODA 2021.	2021
NSF TRIPODS. Institute for Data, Econometrics, Algorithms and Learning with Aravindan Vijayaraghavan and others.	2019
NSF AitF. Mechanism Design and Machine Learning for Peer Grading with Douglas Downey and Eleanor O’Rourke.	2017
NSF AF. Non-revelation Mechanism Design	2016
Teacher of the Year. EECS Dept., Northwestern U.	2011
NSF ICES. Towards Realistic Mechanisms: statistics, inference, and approximation in simple Bayes-Nash implementation. With Shuchi Chawla and Denis Nekipelov.	2011
NSF CAREER Award. Mechanism Design	2009
NSF TF. Mechanism Design and Approximation with Shuchi Chawla.	2008
ALADDIN Post-doctoral Research Fellowship. Carnegie Mellon University.	2003
NSF Math Sciences Post-doctoral Research Fellowship. Declined.	2003
Microsoft Endowed Fellowship. CS Dept., U. of Washington	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

Non-strategic Structural Inference (for Initial Play). 2022
 with Daniel Chui and James Wright
Lower bounds for prior independent algorithms. 2021
 with Aleck Johnsen
Mechanism Redesign. 2017
 with Shuchi Chawla and Denis Nekipelov.

Journal Papers

Fast Core Pricing for Rich Advertising Auctions. *Operations Research* 2022
 with Rad Niazadeh, Nicole Immorlica, Mohammad Resa Khani, and Brendan Lucier.
When is pure bundling optimal?. with Nima Haghpahan *Review of Economic Studies* 2021
Bernoulli factories and black-box reductions in mechanism design. *JACM* 2021
 with Shaddin Dughmi, Robert Kleinberg, and Rad Niazadeh.
Efficient Computation of Optimal Auctions via Reduced Forms. *Math of OR* 2019
 with Saeed Alaei, Hu Fu, Nima Haghpahan, and Azarakhsh Malekian.
Optimal auctions vs. Anonymous Pricing. *Games and Economic Behavior* 2018
 with Saeed Alaei, Rad Niazadeh, Manolis Pountourakis, and Yang Yuan. Special issue.
Non-optimal Mechanism Design. *American Economic Review* 2015
 with Brendan Lucier.

Bayesian Incentive Compatibility and Matchings. *Games and Economic Behavior* 2015
with Robert Kleinberg and Azarakhsh Malekian. Special issue.

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

Optimal Crowdsourcing Contests. *Games and Economic Behavior* 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.

Bayesian Mechanism Design. *FTTCS*¹ 2012

Approximation in Mechanism Design. *American Economic Review* 2012

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

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

Reducing Mechanism Design to Algorithm Design via Machine Learning. *JCSS*² 2008
with Maria-Florina Balcan, Avrim Blum, and Yishay Mansour.

Competitive Auctions. *Games and Economic Behavior* 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

Fair Grading Algorithms for Randomized Exams. *FORC*³ 2023
with Jiale Chen and Onno Zoeter

Non-strategic Structural Inference (for Initial Play). *AAMAS*⁴ 2023
with Daniel Chui and James Wright

Simple Mechanisms for Non-linear Agents. *SODA*⁵ 2023
with Yiding Feng and Yingkai Li

Algorithmic Learning Foundations for Common Law. *CSLaw*⁶ 2022
with Dan Linna, Liren Shan, and Alex Tang

¹Foundations and Trends in Theoretical Computer Science.

²Journal of Computer and Systems Sciences.

³Symposium on Foundations of Responsible Computing.

⁴International Conference on Autonomous Agents and Multiagent Systems

⁵ACM-SIAM Symposium on Discrete Algorithms.

⁶ACM Symposium on Computer Science and Law

- Classification Protocols with Minimal Disclosure.** *CSLaw* 2022
with Jinshuo Dong and Aravindan Vijayaraghavan
- Karp: A Language for NP Reductions.** *PLDI*⁷ 2022
with Chenhao Zhang and Christos Dimoulas
- Visualization Equilibrium.** *IEEE VIS*⁸ 2021
with Paula Kayongo, Glen Sun, and Jessica Hullman
- Revelation Gap for Pricing from Samples.** with Yiding Feng and Yingkai Li *STOC*⁹ 2021
- Welfare-maximizing Guaranteed Dashboard Mechanisms.** *EC*¹⁰ 2021
with Yuan Deng, Jieming Mao, and Balasubramanian Sivan
- Non-quasi-linear Agents in Quasi-linear Mechanisms.** *ITCS*¹¹ 2021
with Moshe Babaioff, Richard Cole, Nicole Immorlica, and Brendan Lucier
- Mechanisms for a no-regret agent: Beyond the common prior.** *FOCS*¹² 2020
with Modibo Camara and Aleck Johnsen
- Benchmark design and prior-independent optimization.** *FOCS* 2020
with Aleck Johnsen and Yingkai Li
- Inference from Prices.** *SODA* 2020
with Aleck Johnsen, Denis Nekipelov, and Zihe Wang.
- A Truthful Cardinal Mechanism for One-Sided Matching.** *SODA* 2020
with Rediet Abebe, Richard Cole, and Vasilis Gkatzelis.
- Sample Complexity for Non-Truthful Mechanisms.** *EC* 2019
with Samuel Taggart.
- Dashboard Mechanisms for Online Marketplaces.** *EC* 2019
with Aleck Johnsen, Denis Nekipelov, and Onno Zoeter.
- Optimal Auctions vs. Anonymous Pricing: Beyond Linear Utility.** *EC* 2019
with Yiding Feng and Yingkai Li.
- An End-to-end Argument in Mechanism Design (Prior-independent Auctions for Budgeted Agents).** With Yiding Feng. *FOCS* 2018
- Fast Core Pricing for Rich Advertising Auctions.** *EC* 2018
with Nicole Immorlica, Mohammad Reza Khani, Brendan Lucier, and Rad Niazadeh.
- Bernoulli Factories and Black-box Reductions in Mechanism Design.** *STOC* 2017
with Shaddin Dughmi, Robert Kleinberg, and Rad Niazadeh

⁷ACM SIGPLAN International Conference on Programming Language Design and Implementation

⁸IEEE Transactions on Visualization and Computer Graphics

⁹ACM Symposium on Theory of Computing.

¹⁰ACM Conference on Economics and Computation.

¹¹Innovations in Theoretical Computer Science Conference

¹²IEEE Symposium on Foundations of Computer Science.

- Bayesian Budget Feasibility with Posted Pricing.** *WWW*¹³ 2016
with Eric Balkanski.
- A/B Testing of Auctions.** *EC* 2016
with Shuchi Chawla and Denis Nekipelov.
- No-regret Learning in Bayesian Games.** *NeurIPS*¹⁴ 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* 2012
with Shuchi Chawla and Balu Sivan. Invited to GEB special issue.
- Mechanism Design via Consensus Estimates, and Cross Checking, and Profit Extraction.** *SODA* 2012
With Bach Ha. Invited to TEAC special issue.
- Truth, Envy, and Profit.** *EC* 2011
with Qiqi Yan. Invited to JET special issue.

¹³International Conference on the World Wide Web.

¹⁴Conference on Neural Information Processing Systems

- 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.
- 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.** *2006*
with Gagan Aggarwal.
- Bayesian Optimal No-deficit Mechanism Design.** *WINE¹⁵ 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.

¹⁵Conference on Web and Internet Economics.

- 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.** *WADS¹⁶ 2005*
with Vladlen Koltun.
- A Lower Bound on the Competitive Ratio of Truthful Auctions.** *STACS¹⁷ 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.** *ESA¹⁸ 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.** *ISAAC¹⁹ 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.** *WAE²⁰ 2001*
with E. Anderson, J. Hall, M. Hobbess, A. Karlin, J. Saia, R. Swaminathan, and J. Wilkes.

¹⁶Workshop on Algorithms and Data Structures.

¹⁷Symposium on Theoretical Aspects of Computer Science.

¹⁸European Symposium on Algorithms.

¹⁹International Symposium on Algorithms and Computation.

²⁰International Workshop on Algorithm Engineering.