

SÉBASTIEN LAHAIE

slahaie@microsoft.com
641 Avenue of the Americas
New York, NY 10011
(917) 472-8234

sebastien.lahaie@gmail.com
66 Prospect Street
Greenwich, CT 06830
(203) 524-8203

Education

HARVARD UNIVERSITY
School of Engineering and Applied Sciences
Ph.D. in Computer Science; November 2007
Thesis: “A Modular Framework for Multi-Agent Preference Elicitation”
Advisor: Prof. David C. Parkes
M.S. in Computer Science; November 2004.

DARTMOUTH COLLEGE
Department of Computer Science
B.A. in Computer Science and Applied Mathematics, *summa cum laude*; May 2002.
Thesis: “Information-theoretic Bounds on the Training and Testing Error of Boosting”
Advisor: Prof. Javed Aslam

Research Experience

MICROSOFT CORP. New York, NY
Senior Researcher, September 2014–present.
Researcher, June 2012–August 2014.
Research centers on computational aspects of market design, drawing on machine learning concepts, with applications to online advertising auctions, combinatorial auctions, and prediction markets.

YAHOO INC. New York, NY
Research Scientist, October 2007–June 2012.
Research in the Microeconomics and Social Systems group. Research areas included marketplace design and empirical analysis of advertising auctions (search and display).

HARVARD UNIVERSITY Cambridge, MA
Research Assistant, September 2002–September 2007.
Coursework includes linear and nonlinear programming, combinatorial optimization, machine learning, microeconomics, and game theory.

YAHOO INC. New York, NY
Pasadena, CA
Research Intern, June–August 2006.
Research Intern, June–September 2005.
Developed improved designs for Yahoo’s search advertising auctions to enhance revenue. Internships resulted in patent filings and conference publications on sponsored search.

Teaching Experience

ALGORITHMIC GAME THEORY (COMS 6998-3) Columbia University
Adjunct Professor, Fall 2008.
Graduate seminar. Conducted a weekly two-hour seminar to a class of 24 on fundamental topics in algorithmic game theory, joint with another instructor.

ITERATIVE COMBINATORIAL EXCHANGES (CS 286R) Harvard University
Teaching Assistant, Spring 2004.
Graduate seminar. Conducted one-hour sections to teach a class of 24 background on game theory and linear programming.

Honors and Awards

NSERC Doctoral Scholarship, Harvard University; 2005–07.
Priest Fellowship, Harvard University; 2002–04.
Phi Beta Kappa, Dartmouth College—*inducted junior year*; 2001.
Town Prize, Dartmouth College—*top computer science major by faculty vote*; 2001.
Canadian Governor-General’s Medal, Bishop’s College School—*valedictorian*; 1997.

- [1] Sébastien Lahaie, David M. Pennock, Amin Saberi, and Rakesh V. Vohra. Sponsored search auctions. In, *Algorithmic Game Theory*, part 28. Cambridge University Press, 2007.

Journals

- [1] Sharad Goel, Jake M. Hofman, Sébastien Lahaie, David M. Pennock, and Duncan J. Watts. Predicting consumer behavior with Web search. *Proceedings of the National Academy of Sciences (PNAS)*, 107(41), 2010.
- [2] Benjamin Lubin, Adam I. Juda, Ruggiero Cavallo, Sébastien Lahaie, Jeffrey Shneidman, and David C. Parkes. ICE: An expressive iterative combinatorial exchange. *Journal of Artificial Intelligence Research (JAIR)*, 33:33–77, 2008.

Conferences

- [1] Jacob Abernethy, Sébastien Lahaie, and Matus Telgarsky. Rate of price discovery in iterative combinatorial auctions. In *Proceedings of the 17th ACM Conference on Economics and Computation (EC)*, 2016.
- [2] Christian Kroer, Miroslav Dudík, Sébastien Lahaie, and Sivaraman Balakrishnan. Arbitrage-free combinatorial market making using integer programming. In *Proceedings of the 17th ACM Conference on Economics and Computation (EC)*, 2016.
- [3] Elaine Wah, Sébastien Lahaie, and David M. Pennock. An empirical game-theoretic analysis of price discovery in prediction markets. In *Proceedings of the 25th International Joint Conference on Artificial Intelligence (IJCAI)*, 2016.
- [4] Hoda Heidari, Sébastien Lahaie, David M. Pennock, and Jennifer Wortman Vaughan. Integrating market makers, limit orders, and continuous trade in prediction markets. In *Proceedings of the 16th ACM Conference on Economics and Computation (EC)*, 2015.
- [5] Erik Zawadzki and Sébastien Lahaie. Nonparametric scoring rules. In *Proceedings of the 29th National Conference on Artificial Intelligence (AAAI)*, 2015.
- [6] Jacob Abernethy, Sindhu Kutty, Sébastien Lahaie, and Rahul Sami. Information aggregation in exponential family markets. In *Proceedings of the 15th ACM Conference on Economics and Computation (EC)*, 2014.
- [7] Sébastien Lahaie and Nisarg Shah. Neutrality and geometry of mean voting. In *Proceedings of the 15th ACM Conference on Economics and Computation (EC)*, 2014.
- [8] Pavel Metrikov, Fernando Diaz, Sébastien Lahaie, and Justin Rao. Whole page optimization: how page elements interact with the position auction. In *Proceedings of the 15th ACM Conference on Economics and Computation (EC)*, 2014.
- [9] Miroslav Dudík, Sébastien Lahaie, David M. Pennock, and David Rothschild. A combinatorial prediction market for the U.S. elections. In *Proceedings of the 14th ACM Conference on Electronic Commerce (EC)*, 2013.
- [10] Eric Sodomka, Sébastien Lahaie, and Dustin Hillard. A predictive model for advertiser value-per-click in sponsored search. In *Proceedings of the 22nd International World Wide Web Conference (WWW)*, 2013.
- [11] Miroslav Dudík, Sébastien Lahaie, and David M. Pennock. A tractable combinatorial market maker using constraint generation. In *Proceedings of the 13th ACM Conference on Electronic Commerce (EC)*, 2012.
- [12] Quang Duong and Sébastien Lahaie. Discrete choice models of bidder behavior in sponsored search. In *Workshop on Internet and Network Economics (WINE)*, 2011.
- [13] Sébastien Lahaie. A kernel-based iterative combinatorial auction. In *Proceedings of the 25th National Conference on Artificial Intelligence (AAAI)*, 2011.
- [14] Sébastien Lahaie and R. Preston McAfee. Efficient ranking in sponsored search. In *Workshop on Internet and Network Economics (WINE)*, 2011.
- [15] Sébastien Lahaie. Kernel methods for revealed preference analysis. In *Proceedings of the 19th European Conference on Artificial Intelligence (ECAI)*, 2010.

- [16] Sébastien Lahaie. Stability and incentive-compatibility in a kernel-based combinatorial auction. In *Proceedings of the 24th National Conference on Artificial Intelligence (AAAI)*, 2010.
- [17] Sharad Goel, Sébastien Lahaie, and Sergei Vassilvitskii. Contract auctions for sponsored search. In *Workshop on Internet and Network Economics (WINE)*, 2009.
- [18] Sébastien Lahaie. A kernel method for market clearing. In *Proceedings of the 21st International Joint Conference on Artificial Intelligence (IJCAI)*, 2009.
- [19] Sébastien Lahaie and David C. Parkes. Fair package assignment. In *Proceedings of the First Conference on Auctions, Market Mechanisms and their Applications (AMMA)*, 2009.
- [20] Sébastien Lahaie and David C. Parkes. On the communication requirements of verifying the VCG outcome. In *Proceedings of the 9th ACM Conference on Electronic Commerce (EC)*, 2008.
- [21] Sébastien Lahaie, David C. Parkes, and David M. Pennock. An expressive auction design for online display advertising. In *Proceedings of the 23rd National Conference on Artificial Intelligence (AAAI)*, 2008.
- [22] Sébastien Lahaie and David M. Pennock. Revenue analysis of a family of ranking rules for keyword auctions. In *Proceedings of the 8th ACM Conference on Electronic Commerce (EC)*, 2007.
- [23] Sébastien Lahaie. An analysis of alternative slot auction designs for sponsored search. In *Proceedings of the 7th ACM Conference on Electronic Commerce (EC)*, 2006.
- [24] Sébastien Lahaie, Florin Constantin, and David C. Parkes. More on the power of demand queries in combinatorial auctions: learning atomic languages and handling incentives. In *Proceedings of the 19th International Joint Conference on Artificial Intelligence (IJCAI)*, 2005.
- [25] David C. Parkes, Ruggiero Cavallo, Nick Elprin, Adam Juda, Sébastien Lahaie, Benjamin Lubin, Loizos Michael, Jeffrey Shneidman, and Hassan Sultan. ICE: An iterative combinatorial exchange. In *Proceedings of the 6th ACM Conference on Electronic Commerce (EC)*, 2005.
- [26] Sébastien Lahaie and David C. Parkes. Applying learning algorithms to preference elicitation. In *Proceedings of the 5th ACM Conference on Electronic Commerce (EC)*, 2004.

Workshops

- [1] Sébastien Lahaie and Preston McAfee. Efficient ranking in sponsored search. In *7th Workshop on Ad Auctions*, 2011.
- [2] Eric Sodomka, Sébastien Lahaie, and Dustin Hillard. A hierarchical model for value estimation in sponsored search. In *7th Workshop on Ad Auctions*, 2011.
- [3] Sihem Amer-Yahia, Sébastien Lahaie, and David C. Parkes. Towards a generic bidding standard for online advertising. In *4th Workshop on Ad Auctions*, 2008.
- [4] Ruggiero Cavallo, David C. Parkes, Adam Juda, Adam Kirsch, Alex Kulesza, Sébastien Lahaie, Benjamin Lubin, Loizos Michael, and Jeffrey Shneidman. TBBL: A tree-based bidding language for iterative combinatorial exchanges. In *IJCAI Workshop on Preference Handling*, 2005.
- [5] Geoffrey Mainland, Laura Kang, Sébastien Lahaie, David C. Parkes, and Matt Welsh. Using virtual markets to program global behavior in sensor networks. In *Proceedings of the ACM SIGOPS European Workshop*, 2004.

Invited Talks *Departmental Seminars*

- [1] Quadratic-price combinatorial auctions. *Informatics Colloquium, University of Zurich, Switzerland*. December 2015.
- [2] Quadratic-price combinatorial auctions. *CS-Econ Seminar, Duke University, Durham NC*. November 2015.
- [3] A combinatorial prediction market for the US elections. *Seminar, Nagoya Institute of Technology, Japan*. December 2014.
- [4] A kernel-based combinatorial auction. *Seminar, Kyushu University, Japan*. December 2014.

- [5] A kernel-based combinatorial auction. *AI Seminar, U. Michigan, Ann Arbor MI*. January 2014.
- [6] Whole page optimization: How page elements interact with the position auction. *IS Seminar, Boston University, Boston MA*. April 2014.
- [7] A combinatorial prediction market for the US elections. *LAMSADE Seminar, Paris-Dauphine, France*. December 2013.
- [8] A combinatorial prediction market for the US elections. *Departmental Seminar, EPFL, Switzerland*. December 2013.
- [9] A kernel-based combinatorial auction. *ECS Seminar, University of Southampton, UK*. December 2013.
- [10] A kernel-based combinatorial auction. *Departmental Seminar, TU Munich, Germany*. December 2013.
- [11] Neutrality of mean proximity voting rules. *ECCO Seminar, University of Liverpool, UK*. December 2013.
- [12] A kernel-based combinatorial auction. *ARC Seminar, Georgia Tech, Atlanta GA*. April 2012.
- [13] A tractable combinatorial market maker using constraint generation. *Computational Economics Seminar, Duke University, Durham NC*. March 2012.
- [14] The kernel approach to combinatorial auction design. *Computer Science Colloquium, Rensselaer Polytechnic Institute, Troy NY*. November 2010.
- [15] A kernel method for market clearing. *Artificial Intelligence Seminar, Cornell University, Ithaca NY*. April 2009.
- [16] An analysis of alternative slot auction designs for sponsored search. *Computer Science Seminar, Brown University, Providence RI*. May 2006.

Workshop Participation

- [1] Integrating market makers, limit orders, and continuous trade in prediction markets. *INFORMS Auctions Cluster, Philadelphia PA*. November 2015.
- [2] Price discovery in subgradient combinatorial auctions. *Conference on Auctions, Market Mechanisms, and their Applications*. August 2015.
- [3] Generalized logarithmic (market) scoring rules. *NIPS Workshop on Transactional Machine Learning, Montreal, Canada*. December 2014.
- [4] On price discovery in iterative combinatorial auctions. *INFORMS Auctions Cluster, San Francisco CA*. October 2014.
- [5] Discrete choice models of bidder behavior in sponsored search. *INFORMS Auctions Cluster, Minneapolis MN*. October 2013.
- [6] A kernel-based combinatorial auction. *INFORMS Auctions Cluster, Phoenix AZ*. October 2012.
- [7] A tractable combinatorial market maker using constraint generation. *Markets, Mechanisms, and Multi-Agent Models (NIPS), Edinburgh UK*. June 2012.
- [8] Modeling sponsored search markets. *Kavli Frontiers of Science Symposium, Irvine CA*. November 2012.
- [9] Maximum entropy scoring rules. *Problem of Prediction Workshop, Kellogg, Evanston IL*. December 2011.
- [10] A kernel method for revealed preference analysis. *CalTech SISL / Yahoo Workshop, Huntington Beach CA*. March 2010.
- [11] A kernel method for market clearing. *CalTech SISL / Yahoo Workshop, Huntington Beach CA*. March 2009.
- [12] An expressive auction design for online display advertising. *ELSE Workshop on Search, Mechanism Design, and the Internet, University College London, London UK*. June 2009.
- [13] Contract auctions for sponsored search. *CalTech SISL / Yahoo Workshop, Huntington Beach CA*. December 2009.

- [14] On the communication requirements of realizing the VCG outcome. *NSF Decentralization Conference, Tulane University, New Orleans LA*. April 2008.
- [15] Efficiency and revenue in certain Nash equilibria of keyword auctions. *CalTech SISL / Yahoo Workshop, Huntington Beach CA*. November 2007.
- [16] Applying learning algorithms to preference elicitation in the Generalized Vickrey Auction. *DIMACS Workshop on Computational Issues in Auction Design, Rutgers, New Brunswick NJ*. October 2004.
- [17] Applying learning algorithms to preference elicitation in the Generalized Vickrey Auction. *SITE Summer Workshop, Stanford University, Stanford CA*. August 2004.

Professional Service

Co-Editor (algorithmic game theory), Economic Inquiry, 2011–2015.

Program Chair, Second Conference on Auctions, Market Mechanisms and their Applications (AMMA'11).

Organizing Committee

- Workshops Chair, 17th ACM Conference on Electronic Commerce (EC'16)
- Organizer, Third New York Computer Science and Economics Day (NYCE'10).
- Organizer, Sixth Workshop on Ad Auctions
- Publicity Chair, First Conference on Auctions, Market Mechanisms and their Applications (AMMA'09).

Senior Program Committee

- 25th International Joint Conference on Artificial Intelligence (IJCAI'16)
- 16th ACM Conference on Electronic Commerce (EC'15)
- 14th ACM Conference on Electronic Commerce (EC'13)

Program Committee

- 15th International Conference on Autonomous Agents and Multiagent Systems (AAMAS'16)
- 30th National Conference on Artificial Intelligence (AAAI'16)
- 9th International Symposium on Algorithm Game Theory (SAGT'16)
- 15th ACM Conference on Electronic Commerce (EC'14)
- 23rd World Wide Web Conference (WWW)—Internet Monetization track, 2014
- 9th Conference on Web and Internet Economics (WINE'13)
- 23rd International Joint Conference on Artificial Intelligence (IJCAI'13)
- 27th National Conference on Artificial Intelligence (AAAI'13)
- 22nd World Wide Web Conference (WWW)—Internet Monetization track, 2013
- 12th International Conference on Autonomous Agents and Multiagent Systems (AAMAS'13)
- 21st World Wide Web Conference (WWW)—Internet Monetization track, 2012
- 13th ACM Conference on Electronic Commerce (EC'12)
- 26th National Conference on Artificial Intelligence (AAAI'12)
- 11th International Conference on Autonomous Agents and Multiagent Systems (AAMAS'12)
- 20th International Joint Conference on Artificial Intelligence (IJCAI'11)
- 25th National Conference on Artificial Intelligence (AAAI'11)
- 10th International Conference on Autonomous Agents and Multiagent Systems (AAMAS'11)
- 14th International Conference on Artificial Intelligence and Statistics (AISTATS'11)
- 11th ACM Conference on Electronic Commerce (EC'10)
- 24th National Conference on Artificial Intelligence (AAAI'10)

- 24th Annual Conference on Neural Information Processing Systems (NIPS'10)
- 10th ACM Conference on Electronic Commerce (EC'09)
- 19th International Joint Conference on Artificial Intelligence (IJCAI'09)
- 25th Conference on Uncertainty in Artificial Intelligence (UAI'09)
- 18th World Wide Web Conference (WWW)—Internet Monetization track, 2009
- 9th ACM Conference on Electronic Commerce (EC'08)
- 17th World Wide Web Conference (WWW)—Internet Monetization track, 2008

Peer Reviewing

Journals: ACM Transactions on Economics and Computation; Journal of Artificial Intelligence Research; Operations Research; Communications of the ACM; ACM Transactions on the Web; ACM Transactions on Internet Technology; Games and Economic Behavior; INFORMS Journal on Computing; Quantitative Marketing and Economics; PLoS ONE.

Conferences: International Conference on Machine Learning (ICML), 2014; Neural Information Processing Systems (NIPS), 2012; International Conference on Information Systems (ICIS), 2011; Workshop on Internet and Network Economics (WINE), 2009; Symposium on Discrete Algorithms (SODA), 2008; International Conference on Autonomous Agents and Multi-Agent Systems (AA-MAS), 2008; Valuetools 2008; ACM Conference on Electronic Commerce (EC), 2007; Theoretical Aspects of Rationality and Knowledge (TARK), 2007; International Conference on Electronic Commerce (ICEC), 2007; National Conference on Artificial Intelligence (AAAI), 2006; Conference on Uncertainty in Artificial Intelligence (UAI), 2006; International Joint Conference on Artificial Intelligence (IJCAI), 2005.

Professional Society Memberships

Senior Member, Association for Computing Machinery (ACM)
 Member, American Association for Artificial Intelligence (AAAI)
 Member, Institute for Operations Research and the Management Sciences (INFORMS)

Research Advising

- Elaine Wah (University of Michigan, now at IEX). Internship at Microsoft, Summer 2015.
- Christian Kroer (Carnegie Mellon). Internship at Microsoft, Summer 2015.
- Hoda Heidari (University of Pennsylvania). Internship at Microsoft, Summer 2014.
- Erik Zawadzki (Carnegie Mellon, now at Facebook). Internship at Microsoft, Summer 2014.
- Mohammad Akbarpour (Stanford). Internship at Microsoft, Summer 2013.
- Nisarg Shah (Carnegie Mellon). Internship at Microsoft, Summer 2013.
- Quang Duong (University of Michigan, now at Google). Internship at Yahoo, Summer 2011.
- Eric Sodomka (Brown University, now at Facebook). Internship at Yahoo, Fall 2010.

Patents

- Framework that facilitates user participation in auctions for display advertisements. Ruggiero Cavallo, Sébastien Lahaie, John Langford, David Pennock, Justin Rao. Filing date: Jan 28, 2014.
- System and method for efficient ranking in online advertising by shaping relevance scores. Sébastien Lahaie and R. Preston McAfee. Filing date: Dec 19, 2011.
- Contract auctions for sponsored search. Sergei Vassilvitskii, Sébastien Lahaie, Sharad Goel. Filing date: Jan 6, 2010.
- Method and apparatus for administering a bidding language for online advertising. Sébastien Lahaie, David Pennock, Sihem Amer-Yahia, David Parkes. Issue date: Sep 3, 2013
- System and method for shaping relevance scores for position auctions. Pavel Berkhin, Chad Carson, Ashvin Kannan, Darshan Kantak, Sébastien Lahaie, Christopher LuVogt, Jan Pedersen, David Pennock, Tong Zhang. Filing date: Jun 8, 2007.

Languages

French (native), English (fluent).