Mohammad Mahdian

PERSONAL INFORMATION

Yahoo! Research
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RESEARCH INTERESTS

Algorithmic Game Theory, and Applications in Online Advertising and Social Networks
Models and Algorithms for the Web and other Social Networks
Approximation Algorithms and Combinatorial Optimization
Computational Complexity
Probabilistic Method in Combinatorics and Graph Theory

EDUCATION

Massachusetts Institute of Technology, Cambridge, Massachusetts, USA.

Ph.D. in Applied Mathematics (February 2000–June 2004)
Thesis title: "Facility location and the analysis of algorithms through factor-revealing programs"
Advisors: Prof. D. Spielman and Prof. M. Goemans

University of Toronto, Toronto, Ontario, Canada.

M.Sc. in Computer Science (1998–2000)
Thesis title: "The strong chromatic index of graphs"
Advisor: Prof. M. Molloy

Sharif University of Technology, Tehran, Iran.

B.Sc. in Computer Engineering (1993–1997)
Thesis title: "Shortest Path Algorithms in Triangulated Irregular Networks"
Advisor: Prof. M. Ghodsi

HONORS AND AWARDS

- ◇ IBM Goldstine Postdoctoral Fellowship in Mathematical Sciences, 2004 (received but declined).
- ◇ Best student paper award in the ACM-SIAM Symposium on Discrete Algorithms (SODA 2005).
- ◇ Best student paper award in the European Symposium on Algorithms (ESA 2003).
- ◇ Microsoft fellowship (August 2003–August 2005).
- ◇ MIT Presidential fellowship (February 2000–June 2001).
- ◇ University of Toronto fellowship (September 1998–January 2000).
- ◇ Ranked 11th in the 2000 ACM International Collegiate Programming Contest World Finals.
- ◇ Ranked 2nd in the 1999 ACM East Central North America Programming Contest.
- ◇ Gold medal in International Mathematics Olympiad (IMO'93).
- ◇ Silver medals in International Olympiad in Informatics (IOI'92 and IOI'93).
- ◇ Erdős number 2!

PROFESSIONAL EXPERIENCE

Senior Research Scientist, Yahoo! Research, September 2006–present.
Research in the Microeconomics and Social Systems group. Research areas include mechanism design for online advertising, models of the web graph, diffusion in social networks, and mechanism design on social networks.

Visiting Researcher, Cornell University, September 2006–December 2006.
Worked with Jon Kleinberg and Éva Tardos as part of the Institute for Social Sciences theme project on social networks.

Postdoctoral Researcher, Microsoft Research, July 2004–June 2006.
Research on algorithm design and algorithmic game theory, in particular algorithmic issues in the design of mechanisms for allocating advertisement space on the web.

Research Intern, IBM Watson Research Lab, Summer 2003.
Research under mentorship of Maxim Sviridenko. Worked on problems related to no-wait scheduling (joint work with Bansal and Sviridenko; appeared in Math of OR), competitive algorithms for QoS buffering (joint work with Bansal, Fleischer, Kimbrel, Schieber, and Sviridenko; appeared in ICALP'04), and k-median and facility location problems.

Research Intern, IBM Almaden Research Lab, May 2003.
Worked with David Williamson, Vijay Vazirani, and Sridhar Rajagopalan on the asymmetric traveling salesman problem, and with Ron Fagin on the rank aggregation problem.

Research Intern, Microsoft Research, Summer 2002 and December 2002–January 2003.
Research under mentorship of Kamal Jain, Jennifer Chayes, and Christian Borgs. Worked on problems related to maximum capacity broadcast in networks (joint work with Jain and Salavatipour; appeared in SODA'03), placement of Internet TAPs in wireless neighborhood networks (joint work with Chandra, Jain, and Qiu; appeared in ICNP'04), clustering newsgroups based on the cross-posts graph (joint work with Borgs, Chayes, and Saberi; appeared in KDD'04), and mechanism design and computation of market equilibria (joint work with Jain and Saberi; appeared in APPROX'03).

Research Assistant, MIT, Summer 2001, Spring and Fall 2002, and Spring 2003.
Research under Prof. Daniel Spielman on Approximation Algorithms, Game Theory, Coding Theory and Analysis of Algorithms.

Research Assistant, University of Toronto, 1998–1999.
Research under Prof. Michael Molloy on applications of the probabilistic method in graph coloring.

Research Assistant, Sharif University of Technology, 1997.
Studied and developed algorithms for finding shortest paths on triangulated irregular networks.

Developer, FarsiTEX Project Group, Sharif University of Technology, 1996–1998.
Responsibilities included implementing an algorithm for converting FarsiTEX files into LATEX. FarsiTEX is a free LATEX-based bilingual (Persian, English) typesetting software that is implemented in Sharif University of Technology (http://www.farsitex.org). The software is currently in widespread use among the academic community in Iran.

TEACHING EXPERIENCE

Instructor, University of Washington, Fall 2005.
Co-taught a graduate course on *"Algorithmic and Economic Aspects of the Internet"*. Topics covered in this course include: Models of power law random graphs, Small world networks, Network creation games, HITS and Page Rank, Web spam, Rank aggregation and voting theory, Spectral clustering, Peering relations on the Internet, P2P networks, Recommendation systems, Reputation mechanisms, and Online advertisement auctions.
Course web-page: `http://www.cs.washington.edu/education/courses/522/05au/`

Teaching Assistant, MIT, Fall 2001.
Course: *Advanced Algorithms*, taught by Prof. Michel Goemans. Responsibilities included designing and grading problem sets, holding office hours, and editing lecture notes.

Mentor, Research Science Institute (RSI), Summers of 2001 and 2000.
Mentored four high school students, one of whom (J. Licht, RSI 2001) won the fourth place in the *National Siemens-Westinghouse competition*, and another (M. Areen, RSI 2000) was a semifinalist in the *Intel Science Talent Search competition*. The RSI program is conducted by the Center for Excellence in Education in collaboration with MIT to promote research among talented high-school students.

Teaching Assistant, University of Toronto, Spring and Fall 1999.
Courses: *Computability and Complexity* and *Discrete Mathematics*. Responsibilities included teaching recitations and grading.

Instructor, Sharif University of Technology, Spring 1998 and Summer 1999.
Courses: *Theory of Distributed Systems*, *Computational Complexity*, *Data Structures and Algorithms*, and

Advanced Programming (C, C++).

Member of the Scientific Committee of Iranian National Computer Olympiad, 1993–1998.
Responsibilities included designing problems and organizing national competitions, teaching and organizing training camps, and accompanying the team to IOI'98 in South Africa as a deputy leader.

SKILLS

Proficient in Java (on Eclipse), C++, Pascal, Matlab, Maple; Familiar with PHP, Perl, MySQL, HTML, C#, AMPL.
Fluent in Persian and English; Familiar with French and Arabic.

SELECTED PUBLICATIONS

All of the following publications are refereed. A complete list of publications with a short description for each paper is available through my homepage.

1. Sai-Ming Li, Mohammad Mahdian, and R. Preston McAfee, *Value of Learning in Sponsored Search Auctions*, Proceedings of the 6th international Workshop on Internet and Network Economics (WINE), 2010.
2. Ravi Kumar, Mohammad Mahdian, and Mary McGlohon, *Dynamics of Conversations*, Proceedings of KDD, 2010.
3. Mohammad Mahdian, *Fighting Censorship with Algorithms*, Proceedings of FUN 2010, pp. 296–306, 2010.
4. Arpita Ghosh and Mohammad Mahdian, *Christmas Gift Exchange Games*, Proceedings of FUN 2010, pp. 228–236, 2010.
5. Li Li, Mohammad Mahdian, and Vahab Mirrokni, *Secure Overlay Network Design*, Algorithmica **57** (1), pp. 82–96, 2010.
6. R. Kumar, M. Mahdian, and A. Sayedi, *Mechanism Design for Complexity-Constrained Bidders*, Proceedings of the 5th international Workshop on Internet and Network Economics (WINE), 2009.
7. M. Mahdian and G. Wang, *Clustering-Based Bidding Languages for Sponsored Search*, Proceedings of the 17th Annual European Symposium on Algorithms (ESA), 2009
8. A. Anagnostopoulos, R. Kumar, M. Mahdian, and E. Upfal, *Sort Me If You Can (or How to Sort Dynamic Data)*, Proceedings of the 36th International Colloquium on Automata, Languages and Programming (ICALP), 2009.
9. N. Chen, N. Immorlica, A. Karlin, M. Mahdian, and A. Rudra, *Approximating Matches Made in Heaven*, Proceedings of the 36th International Colloquium on Automata, Languages and Programming (ICALP), 2009.
10. D. Kempe and M. Mahdian, *A Cascade Model for Externalities in Sponsored Search*, Proceedings of the 4th international Workshop on Internet and Network Economics (WINE), 2008. Preliminary version presented in the 4th Workshop on Ad Auctions, held in conjunction with the 2008 ACM Conference on Electronic Commerce, 2008.
11. M. Mahdian, R. P. McAfee, and D. Pennock, *The Secretary Problem with a Hazard Rate Condition*, Proceedings of the 4th international Workshop on Internet and Network Economics (WINE), 2008.
12. A. Anagnostopoulos, R. Kumar, and M. Mahdian, *Influence and Correlation in Social Networks*, Proceedings of the 14th ACM SIGKDD International Conference on Knowledge Discovery and Data Mining (KDD), 2008.
13. A. Goel, M. Mahdian, H. Nazerzadeh, and A. Saberi, *Advertisement Allocation for Generalized Second Pricing Schemes*, The 4th Workshop on Ad Auctions, held in conjunction with the 2008 ACM Conference on Electronic Commerce, 2008.
14. A. Ghosh and M. Mahdian, *Externalities in Online Advertising*, Proceedings of the 17th International World Wide Web Conference, 2008.
15. N. Immorlica, M. Mahdian, and V.S. Mirrokni, *Limitations of Cross-monotonic Cost Sharing Schemes*, ACM Transactions on Algorithms **4** (2), May 2008.
16. A. Ghosh and M. Mahdian, *Charity Auctions on Social Networks*, Proceedings of the 19th Annual ACM-SIAM Symposium on Discrete Algorithms (SODA), 2008.

17. A. Ghosh, M. Mahdian, D. M. Pennock, D. M. Reeves, and R. Fugger, *Mechanism Design on Trust Networks*, Proceedings of the 3rd international Workshop on Internet and Network Economics (WINE), 2007.
18. M. Mahdian and Y. Xu, *Stochastic Kronecker Graphs*, Proceedings of the 5th Workshop on Algorithms and Models for the Web-Graph (WAW), 2007.
19. E. Arcaute, N. Chen, R. Kumar, D. Liben-Nowell, M. Mahdian, H. Nazerzadeh, and Y. Xu, *Deterministic Decentralized Search in Random Graphs*, Proceedings of the 5th Workshop on Algorithms and Models for the Web-Graph (WAW), 2007.
20. M. Mahdian and K. Tomak, *Pay-per-action model for online advertising*, Proceedings of the 3rd international Workshop on Internet and Network Economics (WINE), 2007. Also presented at the First International Workshop on Data Mining and Audience Intelligence for Advertising (ADKDD), August 2007.
21. N. Immorlica, A. Karlin, M. Mahdian, and K. Talwar, *Balloon Popping With Applications to Ascending Auctions*, Proceedings of the 48th IEEE Symposium on Foundations of Computer Science (FOCS), 2007.
22. N. Immorlica, J. Kleinberg, M. Mahdian, and T. Wexler, *The role of compatibility in the diffusion of technologies in social networks*, Proceedings of the 8th ACM conference on Electronic commerce, 75–83, 2007.
23. M. Mahdian, H. Nazerzadeh, and A. Saberi, *Allocating online advertisement space with unreliable estimates*, Proceedings of the 8th ACM conference on Electronic commerce, 288–294, 2007.
24. U. Feige, K. Jain, M. Mahdian, and V. Mirrokni, *Robust combinatorial optimization with Exponential Scenarios* Proceedings of the 12th International Conference on Integer Programming and Combinatorial Optimization (IPCO), Lecture Notes in Computer Science 4513, 439–453, June 2007.
25. C. Borgs, J. Chayes, O. Etesami, N. Immorlica, K. Jain, and M. Mahdian, *Dynamics of Bid Optimization in Online Advertisement Auctions*, The 16th International World Wide Web Conference (WWW), 2007.
26. N. Immorlica, K. Jain, and M. Mahdian, *Game-Theoretic Aspects of Designing Hyperlink Structures*, Proceedings of the 2nd international Workshop on Internet and Network Economics (WINE), In Lecture Notes in Computer Science 4286, 150–161, 2006.
27. N. Immorlica, R. Kleinberg and M. Mahdian. Secretary problems with competing employers, Proceedings of the 2nd international Workshop on Internet and Network Economics (WINE), In Lecture Notes in Computer Science 4286, 389–400, 2006.
28. L. Li, M. Mahdian, and V. Mirrokni, *Secure Overlay Network Design*, Proceedings of the 2nd International Conference on Algorithmic Aspects in Information and Management (AAIM), In Lecture Notes in Computer Science 4041, 354–366, 2006.
29. M. Mahdian, *Random popular matchings*, Proceedings of the 7th ACM Conference on Electronic Commerce (EC'06), 238–242, 2006.
30. M. Mahdian and A. Saberi, *Multi-unit auctions with unknown supply*, Proceedings of the 7th ACM Conference on Electronic Commerce (EC'06), 243–249, 2006.
31. U. Feige and M. Mahdian, *Finding small balanced separators*, Proceedings of the 38th Annual ACM Symposium on Theory of Computing (STOC), 375–384, 2006.
32. R. Fagin, R. Kumar, M. Mahdian, D. Sivakumar, and E. Vee, *Comparing Partial Rankings*, SIAM Journal on Discrete Mathematics **20** (3), 628-648, 2006.
33. M. Mahdian, Y. Ye, and J. Zhang, *Approximation Algorithms for Metric Facility Location Problems*, SIAM Journal on Computing **36** (2), 411–432, 2006.
34. N. Immorlica, K. Jain, M. Mahdian, and K. Talwar, *Click Fraud Resistant Methods for Learning Click-Through Rates*, Proceedings of the First International Workshop on Internet and Network Economics (WINE), Lecture Notes in Computer Science **3828**, 34–45, 2005.
35. K. Jain, and M. Mahdian, *Computing equilibria in a Fisher market with linear single-constraint production units*, Proceedings of the First International Workshop on Internet and Network Economics (WINE), Lecture Notes in Computer Science **3828**, 788–792, 2005.

36. L. Bazzi, M. Mahdian, and D. Spielman, *The Minimum Distance of Turbo-Like Codes*, IEEE Transactions on Information Theory, Vol 55, Issue 1, Jan 2009, 6–15, 2009.
37. N. Bansal, M. Mahdian, and M. Sviridenko, *Minimizing makespan in no-wait job shops*, Mathematics of Operations Research, **30** (4), 817–831, November 2005.
38. C. Borgs, J. Chayes, N. Immorlica, M. Mahdian, and A. Saberi, *Multi-unit auctions with budget-constrained bidders*, Proceedings of the 6th ACM Conference on Electronic Commerce (EC'05), 44–51, 2005.
39. M.T. Hajiaghayi, R.D. Kleinberg, M. Mahdian, and D. Parkes, *Online Auctions with Re-usable Goods*, Proceedings of the 6th ACM Conference on Electronic Commerce (EC'05), 165–174, 2005.
40. N. Immorlica, M. Mahdian, and V. Mirrokni, *Cycle Cover with Short Cycles*, Proceedings of the 22nd Annual Symposium on Theoretical Aspects of Computer Science (STACS), Lecture Notes in Computer Science **3404**, 641-653, 2005.
41. N. Immorlica, and M. Mahdian, *Marriage, Honesty, and Stability*, Proceedings of the 16th Annual ACM-SIAM Symposium on Discrete Algorithms (SODA), 53–62, 2005.
42. N. Immorlica, M. Mahdian, and V.S. Mirrokni, *Limitations of Cross-monotonic Cost Sharing Schemes*, Proceedings of the 16th Annual ACM-SIAM Symposium on Discrete Algorithms (SODA), 602–611, 2005. (Winner of the best student paper award in SODA 2005)
43. L. Fleischer, K. Jain, and M. Mahdian, *Tolls for heterogeneous selfish users in multicommodity networks and generalized congestion games*, Proceedings of the 45th IEEE Symposium on Foundations of Computer Science (FOCS), 277–285, 2004.
44. C. Borgs, J. Chayes, M. Mahdian, and A. Saberi, *Exploring the Community Structure of Newsgroups*, Proceedings of the 10th ACM SIGKDD International Conference on Knowledge Discovery and Data Mining (KDD), 783–787, 2004.
45. R. Chandra, K. Jain, M. Mahdian, and L. Qiu, *Optimizing the Placement of Internet TAPs in Wireless Neighborhood Networks*, Proceedings of the 12th IEEE International Conference on Network Protocols (ICNP), 271–282, 2004.
46. N. Bansal, L. Fleischer, T. Kimbrel, M. Mahdian, B. Schieber, and M. Sviridenko, *Further Improvements in Competitive Guarantees for QoS Buffering*, Proceedings of the 31st International Colloquium on Automata, Languages and Programming (ICALP), Lecture Notes in Computer Science **3142**, 196–207, 2004.
47. R. Fagin, R. Kumar, M. Mahdian, D. Sivakumar, and E. Vee, *Comparing and Aggregating Rankings with Ties*, Proceedings of the 23rd ACM SIGACT-SIGMOD-SIGART Symposium on Principles of Database Systems (PODS), 47–58, 2004.
48. P. Adams, M. Mahdian, and E.S. Mahmoodian, *On the forced matching numbers of bipartite graphs*, Discrete Mathematics **281**, 1–12, 2004.
49. M. Mahdian and M. Pál, *Universal Facility Location*, Proceedings of the 11th Annual European Symposium on Algorithms (ESA), Lecture Notes in Computer Science **2832**, 409–421, 2003. (Winner of the best student paper award in ESA 2003)
50. K. Jain, M. Mahdian, and A. Saberi, *Approximating Market Equilibria*, Proceedings of the 6th International Workshop on Approximation Algorithms for Combinatorial Optimization Problems (APPROX), Lecture Notes in Computer Science **2764**, 98–108, 2003.
51. M. Mahdian, Y. Ye, and J. Zhang, *A 2-approximation algorithm for the soft-capacitated facility location problem*, Proceedings of the 6th International Workshop on Approximation Algorithms for Combinatorial Optimization Problems (APPROX), Lecture Notes in Computer Science **2764**, 129–140, 2003.
52. K. Jain, M. Mahdian, and M.R. Salavatipour, *Packing Steiner Trees*, Proceedings of the 14th Annual ACM-SIAM Symposium on Discrete Algorithms (SODA), 266–274, 2003.
53. K. Jain, M. Mahdian, E. Markakis, A. Saberi, and V. Vazirani, *Greedy Facility Location Algorithms Analyzed using Dual Fitting with Factor-Revealing LP*, Journal of the ACM, **50** (6), 795–824, November 2003.

54. M.T. Hajiaghayi, M. Mahdian, and V.S. Mirrokni, *Facility Location Problem with General Cost Functions*, Networks, **42** (1), 42–47, August 2003.
55. V. Jungić, J. Fox (Licht), M. Mahdian, J. Nešetril, R. Radoičić, *Rainbow Arithmetic Progressions and Anti-Ramsey Results*, Combinatorics, Probability, and Computing special issue on Ramsey Theory **12**, 599–620, 2003.
56. M. Mahdian, Y. Ye, and J. Zhang, *Improved Approximation Algorithms for Metric Facility Location Problems*, Proceedings of the 5th International Workshop on Approximation Algorithms for Combinatorial Optimization Problems (APPROX), Lecture Notes in Computer Science **2462**, 229–242, 2002.
57. K. Jain, M. Mahdian, and A. Saberi, *A New Greedy Approach for Facility Location Problems*, Proceedings of the 34th Annual ACM Symposium on Theory of Computing (STOC), 731–740, 2002.
58. M. Ghodsi, M. T. Hajiaghayi, M. Mahdian, and V.S. Mirrokni, *Length-constrained Path-matchings in Graphs*, Networks, **39** (4), 210–215, 2002.
59. M. Mahdian, *On the Computational Complexity of Strong Edge Coloring*, Discrete Applied Mathematics **118**, 239–248, 2002.
60. M. Mahdian, E. Markakis, A. Saberi, and V. Vazirani, *A Greedy Facility Location Algorithm Analyzed using Dual-Fitting*, Proceedings of the 4th International Workshop on Approximation Algorithms for Combinatorial Optimization Problems (APPROX), Lecture Notes in Computer Science **2129**, 127–137, 2001.
61. M. Mahdian, *The strong chromatic index of C_4-free graphs*, Random Structures and Algorithms **17**, 357–375, 2000.

Books and Book Chapters

- K. Jain and M. Mahdian, *Cost Sharing*, In *"Algorithmic Game Theory"*, N. Nisan, T. Roughgarden, E. Tardos, and V. V. Vazirani, editors. Cambridge University Press, 2007.
- M. Ghodsi and M. Mahdian, *"Preparing for Computer Olympiads: Problems; Vol I"* (in Persian), Fatemi Pub. Co., Tehran, Iran, June 1999.
  This book contains over 170 algorithmic problems suitable for preparing for computer olympiads and ACM programming competitions.

Working Papers

- S. Goel, M. Mahdian, D. M. Pennock, and D. M. Reeves, *TrustBets: Operating a Prediction Market on an IOU Network*, 2008.
- A. Anagnostopoulos, R. Kumar, M. Mahdian, and E. Upfal, *Dynamic Graph Algorithms*, 2009.

Professional Activities

Editorial Board of

- Theory of Computing

Program Committee of:

- International Workshop on Social Computing, Network, and Services, 2011.
- NIPS Workshop on Machine Learning for Social Computing, 2010.
- Eighteenth Annual European Symposium on Algorithms (ESA 2010)
- ACM SIGKDD Workshop on Social Media Analytics (SOMA 2010)
- ACM SIGKDD Workshop on Social Network Mining and Analysis (SNAKDD 2010)
- International Conference on Computational Aspects of Social Networks 2010 (CASoN 2010)
- Eleventh ACM Conference on Electronic Commerce (EC 2010)
- Sixth International Conference on Algorithmic Aspects in Information and Management (AAIM 2010)
- Eleventh IEEE Conference on E-Commerce Technology (CEC 2009)
- First International Conference on Computational Aspects of Social Networks (CASoN 2009)
- Fifth International Conference on Algorithmic Aspects in Information and Management (AAIM 2009)
- First Conference on Auctions, Market Mechanisms, and Their Applications (AMMA 2009)

- ◇ Fourth Workshop on Internet and Network Economics (WINE 2008)
- ◇ Forty ninth IEEE Symposium on Foundations of Computer Science (FOCS 2008)
- ◇ Ninth ACM Conference on Electronic Commerce (EC 2008)
- ◇ Tenth IEEE Conference on E-Commerce Technology (CEC 2008)
- ◇ Thirteenth Iranian Computer Conference (CSICC 2008)
- ◇ First International Workshop on Data Mining and Audience Intelligence for Advertising (ADKDD 2007)
- ◇ Eighth ACM Conference on Electronic Commerce (EC 2007)
- ◇ Twelfth Iranian Computer Conference (CSICC 2007)
- ◇ Seventeenth Annual ACM-SIAM Symposium on Discrete Algorithms (SODA 2006)
- ◇ Ninth International Workshop on Approximation Algorithms for Combinatorial Optimization Problems (APPROX 2006)
- ◇ First International Conference on Algorithmic Aspects in Information and Management (AAIM 2005)

Workshops Chair of the Tenth ACM Conference on Electronic Commerce (EC 2009).

Guest Editor of the International Journal of Electronic Commerce, special issue on Click Fraud, Winter 2009.

Associate Editor for SIAM Journal of Computing special issue on FOCS'08 (to appear in 2010).

Referee for:

- ◇ **Journals:** Mathematics of Operations Research, ACM Transactions on Algorithms, SIAM Journal on Computing, SIAM Journal on Discrete Mathematics, ACM Transactions on the Web, Algorithmica, Autonomous Agents and Multi-Agent Systems, Discrete Mathematics, Discrete Applied Mathematics, Discrete Optimization, Networks, Journal of Discrete Algorithms, Transportation Science Journal, Decision Support Systems Journal, Information Processing Letters, Random Structures and Algorithms, Theoretical Computer Science, Journal of Autonomous Agents and Multi-Agent Systems, IEEE Journal on Selected Areas in Communications, Australasian Journal of Combinatorics, Ars Combinatoria
- ◇ **Conferences:** IEEE Symposium on Foundations of Computer Science (FOCS), ACM Symposium on Theory of Computing (STOC), ACM Conference on Electronic Commerce (EC), ACM-SIAM Symposium on Discrete Algorithms (SODA), Workshop on Approximation Algorithms for Combinatorial Optimization Problems (APPROX), Symposium on Theoretical Aspects of Computer Science (STACS), International Colloquium on Automata, Languages and Programming (ICALP), European Symposium of Algorithms (ESA), Workshop on Approximation and Online Algorithms (WAOA), International Workshop on Internet and Network Economics (WINE), International Conference on Integer Programming and Combinatorial Optimization (IPCO), Conference on Foundations of Software Technology and Theoretical Computer Science (FSTTCS), Latin American Theoretical Informatics Conference (LATIN)
- ◇ **Grant applications** for the National Science Foundation (NSF), US-Israel Binational Science Foundation (BSF), and Mathematics of Information Technology and Complex Systems (MITACS), part of the Canadian Networks of Centres of Excellence (NCE) Program

Invited talks at:

- ◇ Ontario Combinatorics Workshop, May 2010.
- ◇ NASA Goddard Space Flight Center IS&T Colloquiums, April 2010.
- ◇ University of Maryland, October 2008.
- ◇ Institute for Operations Research and Management Sciences (INFORMS) Annual Meeting, Washington, DC, October 2008.
- ◇ Centrum voor Wiskunde en Informatica (CWI), Amsterdam, Netherlands, July 2008.
- ◇ Sixth International Workshop on Mining and Learning with Graphs, Helsinki, July 2008.
- ◇ Microsoft Research, Redmond, June 2008.

◇ Fifth Conference on Economic Design, Ann Arbor, June 2008.
◇ Institute for Pure and Applied Mathematics (IPAM), UCLA, May 2008.
◇ First Caltech SISL/Yahoo! Theory Workshop, November 2007.
◇ Conference on Diffusion in Networks, University of Essex, July 2007.
◇ University of Washington, April 2007.
◇ Institute for Operations Research and Management Sciences (INFORMS) Annual Meeting, Pittsburgh, November 2006.
◇ Cornell University, October 2006.
◇ University of Maryland, March 2006.
◇ Harvard University, November 2005.
◇ Northeastern University, November 2005.
◇ MIT Mathematics Department (Applied Math Colloquium), November 2005.
◇ Aladdin Workshop on Flexible Network Design, Princeton University, November 2005.
◇ Institute for Operations Research and Management Sciences (INFORMS) Annual Meeting, San Francisco, November 2005.
◇ The 2nd Multidisciplinary International Conference on Scheduling: Theory and Applications (MISTA), Stern School of Business, New York University, July 2005.
◇ University of Toronto, February 2005.
◇ McGill University, February 2005.
◇ École Polytechnique Fédérale de Lausanne (EPFL), January 2005.
◇ IBM Watson Research lab, August 2003 and October 2004.
◇ Microsoft Research, August 2002 and September 2004.
◇ Institute for Operations Research and Management Sciences (INFORMS) Annual Meeting, Denver, October 2004.
◇ University of Washington, October 2004.
◇ IBM Almaden Research lab, May 2003.
◇ Institute for Operations Research and Management Sciences (INFORMS) Annual Meeting, Atlanta, October 2003.
◇ Aladdin workshop on Integrated Logistics, Princeton University, November 2002.

PATENTS

◇ R. Kumar, M. Mahdian, E. Li, D. Agarwal, D. M. Jung, D. Reiley, and R. P. McAfee, Systems and methods for exploring new sponsored search listings of uncertain quality, 2009.
◇ M. Mahdian and G. Wang, Clustering Identical or Disjoint Keyword Sets for Use with Auctions for Online Advertising Space, 2009.
◇ A. Ghosh and M. Mahdian, Automatic Campaign Optimization for Online Advertising Using Return on Investment Metrics, 2009.
◇ A. Anagnostopoulos, R. Kumar, M. Mahdian, and E. Upfal, System, Method, and Apparatus for Sorting at Least Partially Dynamic Data, 2009.
◇ A. Anagnostopoulos, R. Kumar, and M. Mahdian, Systems and Methods for Identification and Measurement of Social Influence and Correlation, 2009.
◇ M. Mahdian and M. Schwarz, Allocation and Pricing of Information Distortion, 2008.
◇ A. Anagnostopoulos, A. Jaffe, R. Kumar, M. Mahdian, M. Mahoney, and M. Slaney, Suggesting Contacts for Social Networks, 2008.
◇ M. Mahdian and H. Nazerzadeh, System and Method for Optimizing Online Keyword Auctions Subject to Budget and Estimated Query Volume Constraints, 2008.
◇ A. Ghosh and M. Mahdian, Charity Auctions on Social Networks, U.S. patent filed, 2007.
◇ M. Mahdian and K. Tomak, Pay-Per-Action Model for Selling Online Advertisements, U.S. patent filed, 2007.
◇ C. Borgs, J. Chayes, N. Immorlica, K. Jain, and M. Mahdian, User-Associated Interactive Advertising Monetization, U.S. patent filed, 2006.
◇ C. Borgs, J. Chayes, G.W. Flake, N. Immorlica, K. Jain, and M. Mahdian, Designing Hyperlink Structures, U.S. patent filed, 2006.
◇ C. Borgs, J. Chayes, M. Chickering, O. Etesami, N. Immorlica, K. Jain, M. Mahdian, and C. Meek, Tools for Campaign Optimization, U.S. patent filed, 2005.
◇ N. Immorlica, K. Jain, M. Mahdian, and K. Talwar, Click-Fraud Resistant Learning of Click-

Through Rates, U.S. patent filed, 2005.

- ◇ C. Borgs, J. Chayes, U. Feige, N. Immorlica, M. Mahdian, and A. Saberi, Posted Price Market for Online Search and Content Ads, U.S. patent filed, 2005.
- ◇ C. Borgs, J. Chayes, U. Feige, M. Mahdian, and A. Saberi, Mechanisms for Setting Dynamic Reserve Prices for Multiple Items of Low Demand, U.S. patent filed, 2005.
- ◇ C. Borgs, J. Chayes, N. Immorlica, M. Mahdian, and A. Saberi, Revenue-Maximizing Algorithm for Multi-Unit Auctions with Private Budgets, U.S. patent filed, 2005.
- ◇ C. Borgs, J. Chayes, U. Feige, N. Immorlica, M. Mahdian, and A. Saberi, Mechanism for Allocating Advertisements of Varying Intervals, U.S. patent filed, 2005.
- ◇ C. Borgs, J. Chayes, U. Feige, J. Goodman, N. Immorlica, M. Mahdian, and A. Saberi, Evaluation and Pricing of User Interactions with Online Advertisements, U.S. patent filed, 2005.
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