

# MohammadTaghi Hajiaghayi

Curriculum Vitæ

Please visit my website at <http://www.cs.umd.edu/~hajiagha/index.html> and my **Google Scholar Page** which contain *updated* Curriculum Vitæ and Publications with links to download and to citations.

*Email is the fastest and the most reliable way of contacting me.*

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## EDUCATIONAL BACKGROUND

- Doctor of Philosophy    Massachusetts Institute of Technology, September 2001 – May 2005.  
Ph.D. in Applied Mathematics (Computer Science),  
Thesis Title: “The Bidimensionality Theory and Its Algorithmic Applications”,  
Advisors: Erik D. Demaine and Tom Leighton
- Master of Mathematics    University of Waterloo, September 2000– September 2001.  
M.Math. in Computer Science,  
Thesis Title: “Algorithms for Graphs of (Locally) Bounded Treewidth”, Advisor:  
Naomi Nishimura
- Bachelor of Science    Sharif University of Technology, September 1997– September 2000.  
B.Sc. in Computer Engineering,  
Thesis Title: “Pseudo-Matching and Multicasting”, Advisor: Mohammad Ghodsi

## APPOINTMENTS

- Jack and Rita G. Minker Associate Professor** (with tenure) in Computer Science Department and University of Maryland Institute for Advanced Computer Studies (UMIACS), University of Maryland (July 2012– Present)
- Jack and Rita G. Minker Assistant Professor** in Computer Science Department and University of Maryland Institute for Advanced Computer Studies (UMIACS), University of Maryland (Aug 2010– June 2012)
- Senior Researcher** in AT&T Labs – Research (June 2007– Present)
- Research Affiliate** in Computer Science and Artificial Intelligence Laboratory, Massachusetts Institute of Technology (June 2007– Present)
- Permanent Member** in Center for Discrete Mathematics and Theoretical Computer Science (DIMACS), Rutgers University (June 2007– Present)
- Postdoctoral Fellow** in School of Computer Science, Carnegie Mellon University (January 2006– January 2007)
- Postdoctoral Associate** in Computer Science and Artificial Intelligence Laboratory, Massachusetts Institute of Technology (June 2005– December 2005 & February 2007– May 2007)
- Research Intern** in Theory Group, Microsoft Research, Summer 2004
- Research Intern** in Department of Mathematical Sciences, IBM T.J. Watson Research Center, Summer 2002

## TEACHING

- Spring 2012            University of Maryland Under-graduate Course CMSC-351, **Introduction to Algorithms**. Rated **3.13/4.00**. Number of Students: 86. All course materials are available at <http://www.cs.umd.edu/~vliaghat/cmssc351/>.
- Fall    2011            University of Maryland Graduate Course CMSC-858F, **Network Design Foundation**. Rated **3.72/4.00 (Highest in CS Dep. in the semester)**. Number of Students: 14. All course materials are available at <http://www.cs.umd.edu/~hajiagha/NetDsgn11/courseNetworkDesign.html>.
- Spring 2011            University of Maryland Under-graduate Course CMSC-351, **Introduction to Algorithms**. Rated **3.09/4.00**. Number of Students: 60. All course materials are available at <http://www.cs.umd.edu/~vliaghat/cmssc351/>.
- Fall    2010            University of Maryland Graduate Course CMSC-858F, **Algorithmic Game Theory**. Rated **3.49/4.00**. Number of Students: 17. All course materials are available at <http://www.cs.umd.edu/~hajiagha/AGT10.html>.

- Spring 2009 Rutgers University Graduate Course CS-514, **Advanced Algorithms: Topics in Game Theory**, with Muthu Muthukrishnan and Aaron Jaggard. Rated **5.00/5.00**. Number of Students: 14. All course materials are available at <http://paul.rutgers.edu/~mangesh/cs514.html>.
- Spring 2008 Rutgers University Graduate Course CS-673, **Network Design and Game Theory**. Rated **4.86/5.00**. Number of Students: 7. All course materials are available at <http://www.mit.edu/~hajiagha/courseNetworkDesign.html>.

**CURRENT PH.D. STUDENTS:**

1. Rajesh Chitnis
2. Vahid Liaghat
3. Reza Khani
4. Anshul Sawant (co-advised with Prof. V. S. Subrahmanian)
5. Melika Abolhasani
6. Hossein Esfandiari

**CURRENT POST-DOCS:**

1. Hamid Mahini
2. David Malec

**PAST PH.D. STUDENTS:**

MohammadHossein Bateni (now at Google Research, Ph.D. student at Princeton University that I mentored his thesis titled “A Primal-Dual Clustering Technique with Applications in Network Design”)

**LONG-TERM SUPPORTED VISITING PH.D. STUDENTS:**

1. Marek Cygan (mid Jul, 2011-mid Dec, 2011, now an Assistant Professor at University of Warsaw, Poland)
2. Saeed Alaei (mid Aug, 2011- mid Jan, 2012, now a Post-doc at Cornell University)

**CURRENT MASTER STUDENTS:**

Catalin Stefan Tiseanu

**UNDERGRADUATE STUDENTS:**

- **Undergraduate at UMD:** Anirudh Agarwal, Omar Ahsan, Anu Bandi, Holman Gao, Steven Hill, and Scott Zimmermann.
- **Undergraduate at Sharif University:** Morteza Zadimoghaddam (became a Ph.D. student at MIT), Shayan Oveisgharan (became a Ph.D. Student at Stanford), Mohammad Moharrami (became a Ph.D. student at University of Washington), Amin S. Sayedi-Roshkhar (became a Ph.D. student at Carnegie Mellon University), Hamid Mahini (became a Ph.D. student at Sharif University), and Nima Haghpanah (became a Ph.D. student at Northwestern University).

**SUMMER STUDENTS AT AT&T:**

Ankur Moitra (a Ph.D. student at MIT), Hossein Bateni (a Ph.D. student at Princeton), and Sina Jafarpour (a Ph.D. student at Princeton).

**PH.D. THESIS AND PROPOSAL COMMITTEE:**

1. Barna Saha (both)
2. Jian Li (both)
3. Saeed Alaei (both)
4. Qi Hu (proposal)
5. Ranjit Kumaresan (thesis)
6. Ryan Carr (thesis)
7. Patrick Roos (thesis)

## GRANTS

Sep	2012–Aug	2016	DARPA, “Efficient Algorithmic Frameworks via Structural Graph Theory”, (PI), Other PI: Erik Demaine — \$1,000,000 (UMD portion)
Sep	2012–Aug	2016	NSF Medium, “General Frameworks for Approximation and Fixed-Parameter Algorithms”, (PI) — \$200,000
Sep	2011–Aug	2012	DARPA/AFRL, “Framework for Efficient Algorithms in Planar Networks and Beyond”, (PI), Other PI: Erik Demaine — \$125,000 (UMD portion)
Jun	2011–May	2014	ONR Young Investigator Award, “Efficient Algorithms for Strategic Problems in Network Design” (PI) — \$535,000
Feb	2012–May	2016	Supplemental Award to NSF CAREER for Undergraduate Research, “Foundations of Network Design: Real-World Networks, Special Topologies, and Game Theory” (PI) — \$16,000
Jul	2011–May	2016	NSF CAREER Award, “Foundations of Network Design: Real-World Networks, Special Topologies, and Game Theory” (PI) — \$500,000
Jan	2011–Dec	2011	Google Faculty Research Award, “Online Auctions” (PI) — \$50,000
May	2011–Aug	2011	AT&T Research Gift, “YellowPages Advertisement Auctions” (PI) — \$2,000
Aug	2010–Jul	2020	Endowed Jack and Rita G. Minker Chair (PI) — \$200,000
Jun	2011–Dec	2012	UMIACS New Research Initiative Award (PI) — \$25,000
Aug	2010–Jul	2016	UMD CS Department Start-up Funds (PI) — \$200,000

## EDITORIAL WORK

1. Guest editor, Special Issue of Selected Papers from SODA 2008, **ACM Transactions on Algorithms (TALG)**.
2. Editor, Algorithms (online journal).

## CONFERENCE AND WORKSHOP COMMITTEES

1. Technical program committee, the 33rd Annual IEEE International Conference on Computer Communications, (INFOCOM), Toronto, Canada, 2014.
2. Program committee, the 45th ACM Symposium on Theory of Computing, (STOC), Stanford, CA, 2013.
3. Program committee, the 21st European Symposium on Algorithms (ESA), Sophia Antipolis, France, September 2013.
4. Program committee, the 16th International Workshop on Approximation Algorithms for Combinatorial Optimization Problems (APPROX), Berkeley, CA, August 2013.
5. Technical program committee, the 32nd Annual IEEE International Conference on Computer Communications, (INFOCOM), Turin, Italy, 2013.
6. Program committee, the 2nd International Conference on Advances in Computing, Communications, and Informatics (ICACCI), Chennai, India, August 2013.
7. Program committee, the 8th Workshop on Internet & Network Economics, (WINE), Liverpool, UK, 2012.
8. Co-organizer, Seminar on Bidimensional Structures: Algorithms, Combinatorics and Logic, Schloss Dagstuhl, Germany, March 2013.
9. Technical program committee, the 31th Annual IEEE International Conference on Computer Communications, (INFOCOM), Orlando, FL, 2012.
10. Program committee, the 23rd Annual ACM Symposium on Parallel Algorithms and Architectures, (SPAA), San Jose, CA, 2011.
11. Co-organizer, Workshop on Approximation Algorithms: The Last Decade and the Next, Princeton, NJ, June 2011.
12. Program committee, the 16th Annual International Computing and Combinatorics Conference (COCOON), Nha Trang, Vietnam, July 2010.
13. Co-organizer, Seminar on Fixed-Parameter and Approximation Algorithms, Schloss Dagstuhl, Germany, December 2009.
14. Organizing Network Design and Algorithms Session, INFORMS, San Diego, CA, October 2009.
15. Program committee, the 19th Annual ACM-SIAM Symposium on Discrete Algorithms (SODA), San Francisco, CA, January 2008.
16. Program committee, International Workshop on Parameterized and Exact Computation (IWPEC), Victoria, Canada, May 2008.

17. Organizing Network Design Session, INFORMS, Washington, DC, October 2008.
18. Program committee, International Conference on Wireless Algorithms (WASA), Dallas, TX, USA, October 2008.
19. Organizing Optimization in Wireless Networks Session, INFORMS, Pittsburgh, PA, November 2006.
20. Program committee, the 2nd ACIS International Workshop on Self-Assembling Wireless Networks (SAWN), Las Vegas, Nevada, June 2006.
21. Program committee, the 11th International CSI Computer Conference (CSICC), Tehran, January 2006.

#### DEPARTMENT AND UNIVERSITY COMMITTEES

1. University of Maryland ACM Faculty Representative, 2012.
2. Coach, University of Maryland ACM-ICPC Programming Contest Team, 2010, 2011, 2012. **Our team advanced to World Finals in 2010 and 2012 and won Mid-Atlantic ACM-ICPC Regional contest in 2012.**
3. Organizer, weekly Capital Area Theory Seminar (CATS), Fall 2010- Present.
4. Member, CS EduTech Working Group, 2012.
5. Member, University of Maryland High School Programming Committee, 2011, 2012.
6. Faculty Member of University of Maryland Student Honor Council, 2012.
7. CS Faculty Representative, CMNS Scholarship Interview Reception, March 7, 2012.
8. Faculty Speaker, CMNS Undergraduate Recruiting Day, March 30, 2012.
9. Member, CMSC Committee for Recruiting of Highly Talented Undergrads, 2012.
10. Member, CMSC Graduate Admission Committee, 2011, 2012, 2013.
11. Member, Revising Mandatory Undergrad Algorithms Courses (CMSC 250&351) Committee, 2011.

#### AWARDS/HONOURS

- Office of Naval Research (ONR) Young Investigator Award, 2011.
- University of Maryland Research and Scholarship Award (RASA), 2011.
- NSF CAREER Award, 2010.
- Google Faculty Research Award, 2010.
- Jack and Rita G. Minker Chair, 2010.
- Winner of **Best Paper Award** in the 22nd ACM Symposium on Parallelism in Algorithms and Architectures (SPAA), 2010.
- Selection of our paper “Hat Guessing Games”, (joint work with Butler, Kleinberg, and Leighton) published in SIAM Journal on Discrete Mathematics as an **Exceptional Paper Published in SIAM’s Specialized Journals** for the *SIGEST section of SIAM Review*. According to SIGEST, the paper has been selected for “the importance of its contributions and topic, its clear writing style, and its broad interest for the SIAM community.”
- Winner of **Best Paper Award** in the 17th International Symposium on Algorithms and Computation (ISAAC), 2006.
- Winner of **Best Engineering Challenge Paper Award** in Robocup, 2001.
- **Third rank in the Middle Size League in World RoboCup Championship 2000** in Melbourne (see <http://www.robocup2000.org>).
- **First rank in the Middle Size League in European RoboCup Championship 2000** in Amsterdam (see <http://www.robocup.nl>).
- Awarded the **Best Undergraduate Prize of Sharif University of Technology (Computer Engineering Department)** in 2000 for the **First** who has finished his B.S. degree in Computer Engineering Department of Sharif University of Technology in three years and whose GPA has been **the most GPA** in this department until the graduation date.
- Scholarship from **Canadian International Graduate Student**, 2000.
- Scholarship from **Communications and Information Technology Ontario**, 2000.
- **Second rank in the ACM Regional Contest**, Tehran, Iran, 1999.
- **Fourth rank in the ACM Regional Contest**, Kanpur, India, 1999.
- **Silver Medal in the 9th International Olympiad in Informatics (IOI’97)**, South Africa, 1997.
- **Gold Medal in 6th Iranian Informatics Olympiad**, 1996.
- **Erdos number 2!** (via collaborating with Noga Alon who is a co-author of Erdos)
- ***h*-index 35!** (according to Google Scholar)

## COLLABORATORS (115 COAUTHORS)

Noga Alon, Matthew Andrews, Aaron Archer, Minoru Asada, Baruch Awerbuch, Mihai Badoiu, Tucker R. Balch, Maria-Florina Balcan, Paramvir Bahl, Mohsen Bahramgiri, MohammadHossein Bateni, Therese C. Biedl, Avrim Blum, Jonathan L. Bredin, Jonathan F. Buss, Steven Butler, Hubert Chan, Timothy M. Chan, Moses Charikar, Chandra Chekuri, Ehsan Chiniforooshan, Rajesh Chitnis, Hamid R. Chitsaz, Don Coppersmith, Erik D. Demaine, Martin L. Demaine, Ken Endo, Jeffrey Erman, Martin Farach-Colton, Uriel Feige, Fedor V. Fomin, Amirali Foroughnassiraei, David Gamarnik, Yashar Ganjali, Alexandre Gerber, Navid Ghaffarzadegan, Mohammad Ghodsi, Reza Ghorbani, Lukasz Golab, Maziar Gudarzi, Anupam Gupta, Mangesh Gupte, Mahdi Hajiaghayi, Lu Han, Abbas Heydarnoori, Liviu Iftode, Nicole Immerlica, Piotr Indyk, Kamal Jain, Mansour Jamzad, David S. Johnson, Howard Karloff, Ken-ichi Kawarabayashi, Moslem Kazemi, Jeong Han Kim, Hiroaki Kitano, Philip Klein, Robert Kleinberg, Guy Kortsarz, Amit Kumar, Lap Chi Lau, James R. Lee, Suk-Bok Lee, Tom Leighton, Li E. Li, Vahid Liaghat, Katrina Ligett, Hamid Mahini, Ebadollah S. Mahmoodian, Ion I. Mandoiu, Mohammad Mahdian, Daniel Marx, Julian Mestre, Vahab S. Mirrokni, Farid Mobasser, Mosen E. Moghaddam, Bojan Mohar, Mohammad Moharrami, Ankur Moitra, Arefeh Nasri, Viswanath Nagarajan, Naomi Nishimura, Zeev Nutov, Shayan Oveisgharan, Lili Qiu, David C. Parkes, Dan Pei, Harald Räcke, Prabhakar Ragde, Satish Rao, R. Ravi, Daniela Rus, Alexander Russell, Amin Saberi, Bashir S. Sadjad, Mohammad R. Salavatipour, Tuomas W. Sandholm, Amin S. Sayedi-Roshkhar, Subhabrata Sen, Pravin Shankar, Aaron Roth, Anastasios Sidiropoulos, Gregory B. Sorkin, Oliver Spatscheck, Peter Stone, Kunal Talwar, Dimitrios M. Thilikos, Marina Thottan, Ruzbeh Tusserkani, Raluca Ursu, Vijay V. Vazirani, Manuela M. Veloso, Tomáš Vinař, David R. Wood, Fuminori Yamasaki, Morteza Zadimoghaddam.

## RESEARCH INTERESTS AND PUBLICATION DOMAINS:

- **NetDsgn**: Network Design Algorithms
- **Game**: Game Theory and Auction Design
- **PlanarNet**: Planar Networks and Bidimensionality Theory
- **Wireless**: Wireless and Sensor Networks
- **Routing**: Routing and Networking
- **Robotics**: Robotics and Robot Algorithms
- **Misc**: Miscellaneous papers including Bioinformatics, Random Structures, Metric Embedding, Scheduling, and Graph Theory.

## SELECTED AND RECENT PUBLICATIONS

Almost all papers are available online from <http://www.mit.edu/~hajiagha/index.html>.

Each paper is listed once, even if it appears in multiple versions.

1. **{NetDsgn}** “PACE: policy-aware application cloud embedding”, (joint work with Chuangxiong Guo, Dan Li, Li Li, Vahid Liaghat, Gordon Wilfong, Richard Yang, and Hongze Zhao), in *Proceedings of the 32nd Annual IEEE Conference on Computer Communications (INFOCOM)*, Torino, Italy, April 2013, to appear.
2. **{NetDsgn}** “Designing FPT algorithms for cut problems using randomized contractions”, (joint work with Rajesh Chitnis, Marek Cygan, Marcin Pilipczuk, and Michal Pilipczuk), in *Proceedings of the 53rd Annual IEEE Symposium on Foundations of Computer Science (FOCS)*, New Brunswick, NJ, October 2012, pages 460–469.
3. **{NetDsgn}** “LP Rounding for k-Centers with Non-uniform Hard Capacities”, (joint work with Marek Cygan and Samir Khuller), in *Proceedings of the 53rd Annual IEEE Symposium on Foundations of Computer Science (FOCS)*, New Brunswick, NJ, October 2012, pages 273–282.
4. **{Game}** “Online prophet-inequality matching with applications to ad allocation” (joint work with Saeed Alaei and Vahid Liaghat), in *Proceedings of the 13th ACM Conference on Electronic Commerce (EC)*, Valencia, Spain, June 2012, pages 18–35.
5. **{NetDsgn}** “Threshold compression for 3G scalable monitoring” (joint work with Suk-Bok Lee, Dan Pei, Ioannis Pefkianakis, Songwu Lu, He Yan, Zihui Ge, Jennifer Yates, and Mario Koseifi), in *Proceedings of the 31st Annual IEEE Conference on Computer Communications (INFOCOM)*, Orlando, FL, March 2012, pages 1350–1358.

6. **{PlanarNet,NetDsgn}** “A polynomial-time approximation scheme for planar multiway cut” (joint work with MohammadHossein Bateni, Philip N. Klein, and Claire Mathieu), in *Proceedings of the 23rd Annual ACM-SIAM Symposium on Discrete Algorithms (SODA)*, Kyoto, Japan, January 2012, pages 639–655.
7. **{NetDsgn}** “Fixed-parameter tractability of directed multiway cut parameterized by the size of the cutset”, (joint work with Rajesh Chitnis and Daniel Marx), **SIAM Journal on Computing**, to appear. A preliminary version appeared in *Proceedings of the 23rd Annual ACM-SIAM Symposium on Discrete Algorithms (SODA)*, Kyoto, Japan, January 2012, pages 1713–1725.
8. **{NetDsgn}** “Directed subset feedback vertex set is fixed-parameter tractable” (joint work with Rajesh Chitnis, Marek Cygan, and Daniel Marx), in *Proceedings of the 39th International Colloquium on Automata, Languages and Programming (ICALP)*, Warwick, UK, July 2012, pages 230–241.
9. **{Game}** “Parameterized complexity of problems in coalitional resource games” (joint work with Rajesh Chitnis and Vahid Liaghat), in *Proceedings of the 25th AAAI Conference on Artificial Intelligence (AAAI)*, San Francisco, CA, August 2011.
10. **{PlanarNet,NetDsgn}** “Contraction decomposition in  $H$ -minor-free graphs and its algorithmic applications” (joint work with Erik Demaine and Ken-ichi Kawarabayashi), in *Proceedings of the 43rd Annual ACM Symposium on Theory of Computing (STOC)*, San Jose, CA, June 2011, pages 441–450.
11. **{NetDsgn}** “On a local protocol for concurrent file transfers” (joint work with Rohit Khandekar, Guy Kortsarz, and Vahid Liaghat), A *special issue* of **Theory of Computing Systems** for selected papers from SPAA 2011, to appear. A preliminary version appeared in *Proceedings of the 23rd Annual ACM Symposium on Parallel Algorithms and Architectures, (SPAA)*, San Jose, CA, June 2011, pages 269–278.
12. **{Game,Wireless}** “AdCell: ad allocation in cellular networks”, (joint work with Saeed Alaei, Vahid Liaghat, Dan Pei, and Barna Saha), in *Proceedings of the 19th Annual European Symposium on Algorithms (ESA)*, Saarbrücken, Germany, September 2011, pages 311–322.
13. **{NetDsgn}** “Scalable monitoring via threshold compression in a large operational 3G network” (joint work with Suk-Bok Lee, Dan Pei, Ioannis Pefkianakis, Songwu Lu, He Yan, Zihui Ge, Jennifer Yates, Mario Koseifi), in *Proceedings of the International Conference on Measurement and Modeling of Computer Systems (SIGMETRICS)*, San Jose, CA, June 2011, 135–136.
14. **{PlanarNet,NetDsgn}** “Approximation schemes for Steiner forest on planar graphs and graphs of bounded treewidth” (joint work with MohammadHossein Bateni and Daniel Marx), **Journal of the ACM**, . 58(5): 21– , 2011. A preliminary version appeared in *Proceedings of the 42nd Annual ACM Symposium on Theory of Computing (STOC)*, Cambridge, MA, June 2010, pages 211–220.
15. **{NetDsgn}** “Capacitated metric labeling” (joint work with Matthew Andrews, Howard Karloff, and Ankur Moitra), in *Proceedings of the 22nd Annual ACM-SIAM Symposium on Discrete Algorithms (SODA)*, San Francisco, CA, January 2011, pages 976–995.
16. **{PlanarNet,NetDsgn}** “Prize-collecting network design on planar graphs” (joint work with MohammadHossein Bateni, Chandra Chekuri, Alina Ene, Nitish Korula, and Daniel Marx), in *Proceedings of the 22nd Annual ACM-SIAM Symposium on Discrete Algorithms (SODA)*, San Francisco, CA, January 2011, pages 1028–1049.
17. **{Game}** “Towards an efficient algorithmic framework for pricing cellular data service” (joint work with MohammadHossein Bateni, Sina Jafarpour, and Dan Pei), in *Proceedings of the 30th Annual IEEE Conference on Computer Communications (INFOCOM)*, Shanghai, China, April 2011, pages 581–585.
18. **{NetDsgn}** “To cache or not to cache: the 3G case” (joint work with Jeffrey Ercan, Alexandre Gerber, Dan Pei, Subhabrata Sen, and Oliver Spatscheck), **IEEE Internet Computing**, 15(2): 27–34, 2011.
19. **{Game}** “Basic network creation games” (joint work with Noga Alon, Erik D. Demaine, and Tom Leighton), **SIAM Journal on Discrete Mathematics**, to appear. A preliminary version appeared in *Proceedings of the 22nd Annual ACM Symposium on Parallel Algorithms and Architectures, (SPAA)*, Santorini, Greece, June 2010, pages 106–113. **This paper is the winner of Best Paper Award in SPAA 2010.**
20. **{NetDsgn}** “Prize-collecting Steiner network problems” (joint work with Rohit Khandekar, Guy Kortsarz, and Zeev Nutov), **ACM Transactions on Algorithms**, 9(1): 2– , 2012. A preliminary version appeared in *Proceedings of the 14th Conference on Integer Programming and Combinatorial Optimization (IPCO)*, Lausanne, Switzerland, June 2010, pages 71–84.
21. **{Game}** “The cooperative game theory foundations of network bargaining games” (joint work with MohammadHossein Bateni, Nicole Immorlica, and Hamid Mahini), in *Proceedings of the 37th Inter-*

- national Colloquium on Automata, Languages and Programming (ICALP)*, Bordeaux, France, July 2010, pages 67–78.
22. **{NetDsgn}** “Budgeted red-blue median and its generalizations” (joint work with Rohit Khandekar and Guy Kortsarz), A *special issue* of **Algorithmica** for selected papers from ESA 2010, 63(4): 795–814, 2012. A preliminary version appeared in *Proceedings of the 18th Annual European Symposium on Algorithms (ESA)*, Liverpool, United Kingdom, September 2010, pages 314–325.
  23. **{PlanarNet}** “Approximation algorithms via contraction decomposition” (joint work with Erik Demaine, and Bojan Mohar), **Combinatorica**, 30(5): 533–552, 2010. A preliminary version appeared in *Proceedings of the 18th Annual ACM-SIAM Symposium on Discrete Algorithms (SODA)*, New Orleans, Louisiana, January 2007, pages 278–287.
  24. **{PlanarNet}** “Decomposition, approximation, and coloring of odd-minor-free graphs” (joint work with Erik D. Demaine and Ken-ichi Kawarabayashi), in *Proceedings of the 21st Annual ACM-SIAM Symposium on Discrete Algorithms (SODA)*, Austin, TX, January 2010, pages 329–344.
  25. **{Game}** “News posting by strategic users in a social network” (joint work with Mangesh Gupte, Lu Han, Liviu Iftode, Pravin Shankar, and Raluca Ursu), in *Proceedings of the 5th International Workshop on Internet and Network Economics (WINE)*, Rome, Italy, December 2009, pages 632–639.
  26. **{NetDsgn}** “Improved approximation algorithms for prize-collecting Steiner tree and TSP” (joint work with Aaron Archer, MohammadHossein Bateni, and Howard Karloff), **SIAM Journal on Computing**, 40(2): 309–332, 2011. A preliminary version appeared in *Proceedings of the 50th Annual IEEE Symposium on Foundations of Computer Science (FOCS)*, Atlanta, GA, October 2009, pages 427–436.
  27. **{PlanarNet}** “Additive approximation algorithms for list-coloring minor-closed class of graphs” (joint work with Erik D. Demaine and Ken-ichi Kawarabayashi), in *Proceedings of the 20th Annual ACM-SIAM Symposium on Discrete Algorithms (SODA)*, New York, NY, January 2009, pages 1166–1175.
  28. **{NetDsgn}** “Assignment problem in content distribution networks: unsplitable hard-capacitated facility location” (joint work with MohammadHossein Bateni), **ACM Transactions on Algorithms**, 8(3): 20, 2012. A preliminary version appeared in *Proceedings of the 20th Annual ACM-SIAM Symposium on Discrete Algorithms (SODA)*, New York, NY, January 2009, pages 805–814.
  29. **{Game}** “The price of anarchy in network creation games” (joint work with Erik D. Demaine, Hamid Mahini, and Morteza Zadimoghaddam), **ACM Transactions on Algorithms**, 8(2): 13, 2012. A preliminary version appeared in *Proceedings of the 26th Annual ACM Symposium on Principles of Distributed Computing (PODC)*, Portland, Oregon, August 2007, pages 292–298.
  30. **{NetDsgn}** “Multi-VPN Optimization for scalable routing via relaying” (joint work with MohammadHossein Bateni, Alexandre Gerber, and Subhabrata Sen), **IEEE/ACM Transactions on Networking**, 18(5): 1544–1556, 2010. A preliminary version appeared in *Proceedings of the 28th Annual IEEE Conference on Computer Communications (INFOCOM)*, Rio de Janeiro, Brazil, April 2009.
  31. **{Wireless}** “Deploying sensor nets with guaranteed fault tolerance” (joint work with Jonathan L. Bredin, Erik D. Demaine, and Daniela Rus), **IEEE/ACM Transactions on Networking**, 18(1): 216–228, 2010. A preliminary version appeared in *Proceedings of the 6th ACM International Symposium on Mobile Ad Hoc Networking and Computing (MobiHoc)*, Urbana-Champaign, IL, May 2005, pages 309–319.
  32. **{NetDsgn}** “Network-aware forward caching” (joint work with Jeffrey Erman, Alexandre Gerber, Dan Pei, and Oliver Spatscheckwith), in *Proceedings of the 18th International Conference on World Wide Web (WWW)*, Madrid, Spain, April 2009, pages 291–300.
  33. **{Misc}** “Scheduling to minimize Staleness and stretch in real-time data warehouses” (joint work with MohammadHossein Bateni, Lukasz Golab, and Howard Karloff), A *special issue* of **Theory of Computing Systems** for selected papers from SPAA 2009, 49(4): 757–780, 2011. A preliminary version appeared in *Proceedings of the 21st Annual ACM Symposium on Parallel Algorithms and Architectures (SPAA)*, Calgary, AB, August 2009, pages 29–38.
  34. **{Wireless,Robotics}** “Minimizing movement: fixed-parameter tractability” (joint work with Erik D. Demaine and Daniel Marx), **ACM Transactions on Algorithms**, to appear. A preliminary version appeared in *Proceedings of the 17th Annual European Symposium on Algorithms (ESA)*, Copenhagen, Denmark, September 2009, pages 718–729. Journal version invited to **Algorithmica special issue** for selected papers from ESA 2009 though regretfully declined.
  35. **{Misc}** “Improved approximation algorithms for label cover problems” (joint work with Moses Charikar and Howard Karloff), A *special issue* of **Algorithmica** for selected papers from ESA 2009, 61(1): 190–206, 2011. A preliminary version appeared in *Proceedings of the 17th Annual European Symposium on Algorithms (ESA)*, Copenhagen, Denmark, September 2009, pages 23–34.

36. **{PlanarNet,NetDsgn}** “Node-weighted Steiner tree and group Steiner tree in planar graphs” (joint work with Erik D. Demaine and Philip Klein), **ACM Transactions on Algorithms**, to appear. A preliminary version appeared in *Proceedings of the 36th International Colloquium on Automata, Languages and Programming (ICALP)*, Rhodes, Greece, July 2009, pages 328–340. Journal version invited to **Theoretical Computer Science special issue** for selected papers from ICALP 2009 though regretfully declined.
37. **{PlanarNet}** “Approximation algorithms via structural results for apex-minor-free graphs” (joint work with Erik D. Demaine and Ken-ichi Kawarabayashi), in *Proceedings of the 36th International Colloquium on Automata, Languages and Programming (ICALP)*, Rhodes, Greece, July 2009, pages 316–327.
38. **{Game}** “The price of anarchy in cooperative network creation games” (joint work with Erik D. Demaine, Hamid Mahini, and Morteza Zadimoghaddam), **ACM SIGecom Exchanges**, 8(2), 2009. A preliminary version appeared in *Proceedings of the 26th International Symposium on Theoretical Aspects of Computer Science (STACS)*, Freiburg, Germany, Feb. 2009, pages 301–312.
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## SUBMITTED MANUSCRIPTS

115. **{NetDsgn}** “The online stochastic generalized assignment problem”, (joint work with Saeed Alaei and Vahid Liaghat), Submitted 2012.
116. **{NetDsgn}** “A constant factor approximation algorithm for fault-tolerant  $k$ -Median”, (joint work with Wei Hu, Jian Li, Shi Li, and Barna Saha), Submitted 2012.
117. **{NetDsgn}** “Stochastic online buffer scheduling”, (joint work with Hossein Esfandiari, Reza Khani, Vahid Liaghat, Hamid Mahini, and Harald Räcke), Submitted 2012.
118. **{NetDsgn}** “Epsilon-approximate equilibria with multiple payoffs and no priors”, (joint work with John Dickerson, Anshul Sawant, and V.S. Subrahmanian), Submitted, 2012.
119. **{NetDsgn}** “Fixed-parameter and approximation algorithms: new conceptual relations”, (joint work with Rajesh Chitnis and Guy Kortsarz), Submitted, 2012.
120. **{NetDsgn}** “Combinatorial algorithms for capacitated network design problems”, (joint work with Rohit Khandekar, Guy Kortsarz, and Zeev Nutov), Submitted, 2012.
121. **{Game}** “Game-theoretic model for the DARPA network challenge”, (joint work with Rajesh Chitnis, Jonathan Katz, and Koyel Mukherjee), Submitted, 2012.

## THESES

1. “The Bidimensionality Theory and Its Algorithmic Applications”, Ph.D. thesis, Department of Mathematics, Massachusetts Institute of Technology, MA, U.S.A., May 2005.
2. “Algorithms for Graphs of (Locally) Bounded Treewidth”, M.Sc thesis, Department of Computer Science, University of Waterloo, Waterloo, Canada, September 2001.
3. “Multicasting and Pseudomatching”, B.Sc. Thesis, Department of Computer Engineering, Sharif University of Technology, Tehran, Iran, August 2000.

## CHAPTERS IN BOOKS.

1. Erik D. Demaine, MohammadTaghi Hajiaghayi: Approximation Schemes for Planar Graph Problems. Ming-Yang Kao (Ed.): *Encyclopedia of Algorithms*, pages 59-62, Springer, 2008.
2. Erik D. Demaine, MohammadTaghi Hajiaghayi: Bidimensionality. Ming-Yang Kao (Ed.): *Encyclopedia of Algorithms*, pages 88-90, Springer, 2008.

## INVITED TALKS AT RESEARCH INSTITUTIONS AND UNIVERSITIES

- |      |      |   |
|------|------|---|
| Oct  | 2012 | “Minimizing Movement”, Wayne State University, Detroit, MI.   |
| Oct  | 2012 | “Minimizing Movement: Approximability and Fixed Parameter Tractability”, Maryland Theory Day, MD.   |
| Jul  | 2012 | “Prophet-Inequality Setting with Applications to Ad Allocation”, Flexible Network Design Workshop, Warsaw, Poland.                        |
| May  | 2012 | “Prophet-Inequality Setting with Applications to Ad Allocation”, Lorentz International Center for workshops in the Sciences, Netherlands. |
| Aug. | 2011 | “Prophet-Inequality Setting with Applications to Ad Allocation”, University of Toronto, Canada.   |
| Jul. | 2011 | “Prophet-Inequality Setting with Applications to Ad Allocation”, Google Research, New York City, NY.                                      |
| Jun. | 2011 | “Prize-collecting Frameworks”, Workshop on Approximation Algorithms: The Last Decade and the Next, Princeton, NJ.                         |

- Feb. 2011 “Prize-collecting Clustering and Algorithmic Applications”, NII Shonan Center, Japan.
- Mar. 2010 “Minimizing Movement”, Computer Science Department, Brown University.
- Nov. 2009 “Online Auctions for Dynamic Environments”, Computer Science Department, University of Maryland.
- Oct. 2009 “Improved approximation algorithms for prize-collecting Steiner tree and TSP”, Microsoft Research, Redmond.
- Aug. 2009 “Node-weighted Steiner Tree and Group Steiner Tree in Planar Graphs”, Meeting of the International Symposium for Mathematical Programming, Chicago, IL.
- Oct. 2008 “Network Creation Games”, INFORMS Annual Meeting 2008, Washington, DC.
- Feb. 2008 “Approximation Algorithms for Non-Uniform Buy-at-Bulk Network Design and Related Problems”, Computer Science and Engineering Department, Pennsylvania State University.
- Dec. 2007 “Algorithms for Wireless Networks”, Institut für Informatik, Universität Freiburg, Freiburg, Germany.
- Nov. 2007 “Approximation Algorithms for Non-Uniform Buy-at-Bulk Network Design and Related Problems”, AT&T Labs - Research.
- Oct. 2007 “Algorithmic Graph Minor Theory”, Fall School on Algorithmic Graph Structure Theory, Berlin, Germany.
- Apr. 2007 “Plane Embeddings of Planar Graph Metric”, School of Computer Science, McGill University, Montreal, Canada.
- Apr. 2007 “Algorithms for Wireless Network Design”, College of Computer Science, Northeastern University.
- Dec. 2006 “Algorithms for Wireless Networks”, INRIA, Nice, France.
- Dec. 2006 “Approximation Algorithms for Non-Uniform Buy-at-Bulk Network Design”, INRIA, Nice, France.
- Nov. 2006 “Algorithms for Wireless Network Design”, Department of Computer Science, University of Pittsburgh.
- Nov. 2006 “Approximation Algorithms for Non-Uniform Buy-at-Bulk Network Design and Related Problems”, Theory Lunch, Carnegie Mellon University.
- Oct. 2006 “Bidimensionality Theory and Algorithmic Graph Minor Theory”, BIRS Workshop on Topological Graph Theory and Crossing Numbers, Banff, Canada.
- Oct. 2006 “Approximation Algorithms for Non-Uniform Buy-at-Bulk Network Design and Related Problems”, Workshop on Flexible Network Design, Bertinoro, Italy.
- Aug. 2006 “Auctions for dynamic environments: WiFi, last-minute tickets and grid computing”, Workshop on Network Design: Optimization and Algorithmic Game Theory, Montreal, Canada.
- Apr. 2006 “Auctions for dynamic environments: WiFi, last-minute tickets and grid computing”, The Joint ALADDIN/Theory/Operations Research Seminar, Carnegie Mellon University.
- Apr. 2006 “(Graph) Algorithms for Wireless Networks”, AT&T Labs - Research.
- Mar. 2006 “Plane Embeddings of Planar Graph Metric”, Theory Seminar, Carnegie Mellon University.
- Mar. 2006 “Fast Algorithms for Hard Graph Problems: Bidimensionality, Minors, and (Local) Treewidth”, Theory Seminar, University of Waterloo.
- Oct. 2005 “(Graph) Algorithms for Wireless Networks”, Flexible Network Design Workshop, Princeton University.
- Apr. 2005 “(Graph) Algorithms for Wireless Networks”, Computer Science Seminar, University of Southern California.
- Apr. 2005 “(Graph) Algorithms for Wireless Networks”, Computer Science Seminar, University of California at San Diego.
- Feb. 2005 “Fast Algorithms for Hard Graph Problems: Bidimensionality, Minors, and (Local) Treewidth”, Theory Seminar, Cornell University.
- Jan. 2005 “Fast Algorithms for Hard Graph Problems: Bidimensionality, Minors, and (Local) Treewidth”, The Joint ALADDIN/Theory/Operations Research Seminar, Carnegie Mellon University.
- Jan. 2005 “Fast Algorithms for Hard Graph Problems: Bidimensionality, Minors, and (Local) Treewidth”, Theory Seminar, University of Washington.
- Dec. 2004 “Fast Algorithms for Hard Graph Problems: Bidimensionality, Minors, and (Local) Treewidth”, Department of Mathematical Sciences, IBM T.J. Watson Research Center.
- Nov. 2004 “Fast Algorithms for Hard Graph Problems: Bidimensionality, Minors, and (Local) Treewidth”, Theory Seminar, University of California, Berkeley.
- Nov. 2004 “Fast Algorithms for Hard Graph Problems: Bidimensionality, Minors, and (Local) Treewidth”,

- Algorithms Seminar, Stanford University.
- Jul. 2004 “Online Auctions, Strategyproofness and Random Valuations”, Theory Group, Microsoft Research.
- Nov. 2002 “Approximation and fixed parameter algorithms for generalizations of planar graphs”, CS Principles and Methodologies Group, IBM Almaden Research Center.
- Aug. 2002 “Approximation and fixed parameter algorithms for generalizations of planar graphs”, Department of Mathematical Sciences, IBM T.J. Watson Research Center.

#### OTHER INVITATIONS (THAT UNFORTUNATELY I DID NOT HAVE A CHANCE TO ATTEND)

- Feb. 2006 Algorithmic Graph Theory Workshop, Oberwolfach, Germany.
- Nov. 2005 Network Design Session, INFORMS, San Francisco, U.S.A.
- Jul. 2005 Workshop on Exact Algorithms and Fixed-Parameter Tractability, Dagstuhl, Germany.
- Sep. 2003 Workshop on Structural and Probabilistic Approaches to Graph Colouring, Banff International Research Station, Canada.

#### PATENTS

1. **System and method for assigning requests in a content distribution network**,  
*US Patent 8,316,106 granted Nov 20, 2012*, Co-inventor(s): MohammadHossein Bateni.
2. **Network aware forward caching II**,  
*US Patent 8,312,141 granted Nov 13, 2012*, Co-inventor(s): Jeffrey Erman, Alexandre Gerber, Dan Pei, and Oliver Spatscheckwith.
3. **Designing minimum total cost networks using iterative rounding approximation methods**,  
*US Patent 8,238,251 granted Aug 7, 2012*.
4. **Methods and apparatus to implement scalable routing in network communication systems**,  
*US Patent 8,218,454 granted Jul 10, 2011*, Co-inventor(s): MohammadHossein Bateni, Alexandre Gerber, and Subhabrata Sen.
5. **Network aware forward caching**,  
*US Patent 8,103,768 granted Jan 24, 2012*, Co-inventor(s): Jeffrey Erman, Alexandre Gerber, Dan Pei, and Oliver Spatscheckwith.
6. **Approximating node-weighted Steiner network of terminals**,  
*US Patent 7,933,224 granted Apr 26, 2011*, Co-inventor(s): Erik D. Demaine and Philip Klein.
7. **Scalable multiprotocol label switching based on virtual private networks and methods to implement the same**,  
*US Patent 7,796,607 granted Sep 14, 2010*, Co-inventor(s): Alexandre Gerber, Changhoon Kim, Carsten Lund, Dan Pei, and Subhabrata Sen.
8. **Wireless LAN cell breathing**,  
*US Patent 7,715,353 granted May 11, 2010*, Co-inventor(s): Paramvir Bahl, Kamal Jain, Vahab S. Mirrokni, Lili Qui, and Amin Saberi.
9. **News posting by strategic users in a social network**,  
Pending patent with application number 12/636,237, Filed December 2009, Co-inventor(s): Mangesh Gupte, Lu Han, Liviu Iftode, Pravin Shankar, and Raluca Ursu.
10. **Minimizing staleness in real-time data warehouses**,  
Pending patent with application number 12/539,429, Filed August 2009, Co-inventor(s): MohammadHossein Bateni, Lukasz Golab, and Howard Karloff.
11. **Generalized deadlock resolution in databases**,  
Pending patent with application number 11/271,130, Filed November 2005, Co-inventor(s): Kamal Jain and Kunal Talwar.

#### SERVED AS REFEREE

**Journals:** Journal of the ACM, SIAM Journal on Computing, SIAM Journal on Discrete Mathematics, Combinatorica, Mathematics of Operation Research, Operations Research, ACM Transactions on Algorithms, Algorithmica, Journal of Combinatorial Theory, Series B, Theory of Computing, Communications of the ACM, Random Structures and Algorithms, Theoretical Computer Science, Journal of Graph Algorithms and Applications, Journal of Discrete Algorithms, Journal of Graph Theory, Networks, IEEE/ACM Transactions on Networking, ACM Transactions on Sensor Networks, IEEE Journal on Selected Areas in Communications, IEEE Transactions on Automatic Control, IEEE Transactions on Parallel and Distributed Systems, IEEE Signal Processing Letters, Discrete Mathematics, Discrete Applied

Mathematics, Journal of Parallel and Distributed Computing, Operations Research Letters, Information Processing Letters, The Australasian Journal of Combinatorics.

**Conferences:** IEEE Symposium on Foundations of Computer Science (FOCS), ACM Symposium on Theory of Computing (STOC), ACM-SIAM Symposium on Discrete Algorithms (SODA), ACM Symposium on Computational Geometry (SoCG), Innovations in Theoretical Computer Science (ITCS), IEEE Conference on Computational Complexity (CCC), ACM Symposium on Parallelism in Algorithms and Architectures (SPAA), ACM Conference on Electronic Commerce (EC), International Conference on Integer Programming and Combinatorial Optimization (IPCO), International Colloquium on Automata, Languages and Programming (ICALP), Annual European Symposium on Algorithms (ESA), Foundations of Software Technology and Theoretical Computer Science (FSTTCS), Scandinavian Workshop on Algorithm Theory (SWAT), The IEEE Conference on Computer Communications (INFOCOM), ACM SIGKDD International Conference on Knowledge Discovery and Data (KDD), International Workshop on Approximation Algorithms for Combinatorial Optimization Problems (APPROX), Scandinavian Workshop on Algorithm Theory (SWAT), Latin American Theoretical Informatics Symposium (LATIN), International Computing and Combinatorics Conference (COCOON), International Symposium on Mathematical Foundations of Computer Science (MFCS), Symposium on Theoretical Aspects of Computer Science (STACS), International Symposium on Algorithms and Computation (ISAAC), IEEE International Conference on Communications (ICC), Workshop on Graph Theoretic Concepts in Computer Science (WG), Workshop on Algorithm Engineering and Experimentation (ALENEX), International Conference on Parallel Processing (ICPP), International Workshop on Approximation and Online Algorithms (WAOA), International Workshop on Parameterized and Exact Computation (IWPEC).

**Panels and Grant Reviews:** Panelist for NSF CCF Algorithmic Foundation, Review for Research Grants Council of Hong Kong, Review for Israel Science Foundation.

#### PROFESSIONAL MEMBERSHIPS

Association for Computing Machinery (ACM)  
American Mathematical Society (AMS)  
Society for Industrial and Applied Mathematics (SIAM)

#### SOFTWARE SKILLS

Programming in Basic, Pascal, PC 8086 Assembly, C, C++, LISP, Prolog, Smalltalk, Maple, Lex/Flex, YACC/Bison, Fortran, TeX and LaTeX, PostScript, Standard ML, HTML 4, Java, JavaScript, Matlab, Mathematica, DirectX.

Experienced in working on Unix, Linux and Windows operating systems.