

# 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.

**citations:** 10105, ***h-index:***54, ***i10-index:***182 (according to *Google Scholar*)

***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 Professor** in Computer Science Department and University of Maryland Institute for Advanced Computer Studies (UMIACS), University of Maryland (April 2016– Present)

**Affiliate Professor** in the Decision, Operations, and Information Technologies Area of the University of Maryland Robert H. Smith School of Business (August 2016– Present)

**Visiting Research Scientist** at Google Research, New York City, (January 2017– January 2018)

**Visiting Scientist** in the Simons Institute for the Theory of Computing at University of California, Berkeley (August 2016– December 2016, January 2018– December 2018)

**Research Consultant** in Microsoft Research at New England (October 2016– December 2016)

**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– April 2016)

**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)

**Research Consultant** in Microsoft Research at New York City (April 2016–August 2016)

**Senior Researcher** in AT&T Labs – Research (June 2007–July 2013)

**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

## AWARDS/HONOURS

1. **ACM International Collegiate Programming Contest (ICPC) Coach Award**, 2017 (for advancing University of Maryland programming teams FIVE times to World Finals).

2. **Chair of Program Committee**, the 29th Annual ACM Symposium on Parallel Algorithms and Architectures, (SPAA), Washington, DC, 2017.
3. European Association for Theoretical Computer Science (**EATCS**) **Nerode Prize**, 2015 (for our outstanding paper on **Bidimensionality Theory**).
4. The University of Maryland **Graduate Faculty Mentor of the Year Award**, 2015.
5. **Google Faculty Research Award**, 2014.
6. Office of Naval Research (**ONR**) **Young Investigator Award**, 2011 (*one out of 22* in all areas of science and engineering; *one out of two* in computer science).
7. University of Maryland **Research and Scholarship Award** (RSA), 2011.
8. **NSF CAREER Award**, 2010.
9. **Google Faculty Research Award**, 2010.
10. Jack and Rita G. Minker Chair, 2010.
11. Winner of **Best Paper Award** in the 22nd ACM Symposium on Parallelism in Algorithms and Architectures (SPAA), 2010.
12. 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.”
13. Winner of **Best Paper Award** in the 17th International Symposium on Algorithms and Computation (ISAAC), 2006.
14. **ALADDIN Postdoctoral Fellowship** from Carnegie Mellon University, 2005.
15. Winner of **Best Engineering Challenge Paper Award** in Robocup, 2001.
16. **Third rank in the Middle Size League in World RoboCup Championship 2000** in Melbourne (see <http://www.robocup.org>).
17. **First rank in the Middle Size League in European RoboCup Championship 2000** in Amsterdam (see <http://www.robocup.org>).
18. Awarded the **Best Undergraduate Prize of Sharif University of Technology in Computer Engineering** in 2000 for the **First** who has finished his B.S. degree in Computer Engineering Department in three years with highest GPA ever until the date of the graduation.
19. Scholarship from **Canadian International Graduate Student**, 2000.
20. Scholarship from **Communications and Information Technology Ontario**, 2000.
21. **Second** rank in the **ACM-ICPC Regional Contest**, Tehran, Iran, 1999.
22. **Fourth** rank in the **ACM-ICPC Regional Contest**, Kanpur, India, 1999.
23. **Silver Medal** in the **9th International Olympiad in Informatics (IOI’97)**, South Africa, 1997.
24. **Gold Medal** in **6th Iranian Informatics Olympiad**, 1996.
25. **Erdos number 2!** (via collaborating with Noga Alon who is a co-author of Erdos)

## MEDIA RECOGNITION

1. New Algorithm for ”Envy-Free” Task Division <http://www.umiacs.umd.edu/about-us/news/umd-team-led-hajiaghayi-designs-new-algorithm-envy-free-task-division>
2. After Nearly a Century, Colonel Blotto Game Theory Scenario Solved, Feb 2016, see, e.g.,:
  - <http://www.businessinsider.com.au/scientists-say-they-can-predict-two-party-outcomes-after-solving-the-95-year-old-colonel-blotto-game-theory-problem-2016-2>
  - <http://www.europapress.es/ciencia/laboratorio/noticia-juego-coronel-blotto-algoritmo-indica-mejor-estrategia-20160216145829.html>
  - <http://russia.timesofnews.com/well-known-game-theory-scenario-solved/>
  - <https://arizonadailyindependent.com/2016/02/13/colonel-blotto-findings-to-be-revealed-in-phoenix/>
  - [http://www.tivi.fi/Kaikki\\_uutiset/kenesta-presidentti-tietokone-tietaa-6303496](http://www.tivi.fi/Kaikki_uutiset/kenesta-presidentti-tietokone-tietaa-6303496)
  - <http://www.scientificcomputing.com/news/2016/02/after-nearly-century-colonel-blotto-game-theory-scenario-solved>
  - <http://www.dbknews.com/2016/03/03/algorithm-solves-colonel-blotto-game-theory-umd/>
  - <http://forskning.no/2016/02/algoritme-vil-spa-hvem-som-blir-usas-neste-president>
  - [http://digit.mandiner.hu/cikk/20160218\\_jatekelmelettel\\_nyerjen\\_elnokvalasztast](http://digit.mandiner.hu/cikk/20160218_jatekelmelettel_nyerjen_elnokvalasztast)
  - <http://www.mylder.no/tips/21610955/Forskere+vil+regne+ut+hvem+som+blir+USAs+neste+president>
  - <http://www.itbiz.cz/clanky/problem-plukovnika-blotta-vyresen>
  - <http://pc-huolto.com/index.php?page=news>

- <http://umdrighnow.umd.edu/news/umd-led-team-first-solve-well-known-game-theory-scenario>
  - <https://cmns.umd.edu/news-events/features/3426>
  - <http://myinforms.com/en-au/a/24189185-scientists-say-they-can-predict-two-party-outcomes-after-solving-a-95-year-old-game-theory-problem/>
  - <http://www.datacentremangement.org/2016/02/after-nearly-a-century-colonel-blotto-game-theory-scenario-solved/>
  - <http://technews.acm.org/>
  - <http://www.forwardgeek.com/article/UMD-led-Team-First-to-Solve-Well-known-Game-Theory-Scenario-Study-20160215-page2>
  - <http://www.prweb.com/releases/2016/02/prweb13217111.htm>
  - <http://www.virtual-strategy.com/2016/02/15/umd-led-team-first-solve-well-known-game-theory-scenario-study?page=0,1#axzz40PAuhllb>
  - <http://www.scientificcomputing.com/news/2016/02/after-nearly-century-colonel-blotto-game-theory-scenario-solved>
  - <http://www.engadget.com/2016/02/12/game-theory-algorithm/>
  - [http://www.eurekalert.org/pub\\_releases/2016-02/uom-utf021116.php](http://www.eurekalert.org/pub_releases/2016-02/uom-utf021116.php)
  - <http://phys.org/news/2016-02-team-well-known-game-theory-scenario.html>
  - <https://scifeeds.com/news/team-first-to-solve-well-known-game-theory-scenario/>
  - <http://campaignmode.com/StrategyDefined/2016/02/12/colonel-blotto-defeated/>
  - <http://www.sciencenewslne.com/summary/2016021212280019.html>
  - <http://trendson.top/umd-led-team-first-to-solve-well-known-colonel-blotto-game-theory-scenario/>
  - [https://www.sciencedaily.com/releases/2016/02/160211190010.htm?utm\\_source=feedburner&utm\\_medium=feed&utm\\_campaign=Feed%3A+sciencedaily%2Fcomputers\\_math%2Fcomputer\\_science+%28Computer+Science+News+--+ScienceDaily%29&utm\\_content=Google+Feedfetcher](https://www.sciencedaily.com/releases/2016/02/160211190010.htm?utm_source=feedburner&utm_medium=feed&utm_campaign=Feed%3A+sciencedaily%2Fcomputers_math%2Fcomputer_science+%28Computer+Science+News+--+ScienceDaily%29&utm_content=Google+Feedfetcher)
  - <http://www.mathesia.com/community/a-new-algorithm-is-capable-of-solving-colonel-blotto-game-theory-scenario/>
  - <http://climateerinvest.blogspot.com/2016/02/game-theorys-colonel-blotto-scenario.html>
  - <https://plus.google.com/+CiroVilla/posts/9a4JofH4XTF>
  - <https://www.facebook.com/DARPA/posts/10154134868827150>
3. Study Ranks UC San Diego #5 Among Theoretical Computer Science Programs Nationwide, 2014, <http://www.cse.ucsd.edu/node/2652>
  4. Incentive-aware Algorithm Design, *Terp Magazine* (Winter 2013, Vol 10, No 2)

## STUDENT AWARDS

1. Saeed Seddighin received **Ann G. Wylie Dissertation Fellowship**, University of Maryland, (2018)
2. Amin Ghiasi, Ramasai Tadepalli, and Jason Zou as our UMD ACM-ICPC team (with me as the coach) from the ACM ICPC Mid-Atlantic Regional contest **advanced to ACM-ICPC World Finals** (2017)
3. Soheil Ehsani received *one of twenty-one* **World Quantitative and Science Scholarship** (2017)
4. Mahsa Derakhshan, John Tan, and Hadi Yami as our UMD ACM-ICPC team (with me as the coach) from the ACM ICPC Mid-Atlantic Regional contest **advanced to ACM-ICPC World Finals** (2016)
5. Hossein Esfandiari received **Google US/Canada PhD Fellowship**, in *Market Algorithms* (2016)
6. Hossein Esfandiari received **Ann G. Wylie Dissertation Fellowship**, University of Maryland, (2015)
7. Reza Khani received **Outstanding Graduate Assistant Award** (2015)
8. Vahid Liaghat received **Google US/Canada PhD Fellowship**, in *Market Algorithms* (*one of only fourteen* recipients from the United States and Canada and the *only one* awardee in *Market Algorithms* in 2013-2014) (2014)
9. Hossein Esfandiari received *one of twenty-one* **World Quantitative and Science Scholarship** (2014)
10. Hossein Esfandiari and Reza Khani *selected* for **Future Faculty Scholarship and Program** (2014)
11. Vahid Liaghat received **Ann G. Wylie Dissertation Fellowship**, University of Maryland, (2014)
12. Hossein Esfandiari received **Distinguished Graduate Student Teaching Award**, University of Maryland (2013)
13. Rajesh Chitnis won **Larry S. Davis Doctoral Dissertation Award** for PhD thesis from University of Maryland. Also his thesis is *nominated for ACM Doctoral Dissertation Award as well as EATCS Distinguished Dissertation Award* (2014).
14. Rajesh Chitnis received College of Computer, Mathematical, & Natural Sciences (CMNS) **Board of Visitor's Award for Outstanding Graduate Student** at the University of Maryland (Awarded to 2 students out of the 10 departments in the college) (2014)

15. Sina Dehghani, Soheil Ehsani, and Xi Yi as our UMD ACM-ICPC team (with me as the coach) from the ACM ICPC Mid-Atlantic Regional contest **advanced to the ACM-ICPC World Finals** (2014)
16. Rajesh Chitnis received *one of the seven* **Simons Awards for Graduate Students in Theoretical Computer Science** (2013)
17. Rajesh Chitnis won **Best Paper Award in European Symposium on Algorithms (ESA)** (2013)
18. Rajesh Chitnis received **Gannon Award for Outstanding Graduate Students** by University of Maryland (2013)
19. Scott DellaTorre, Dylan Ladwig, and Rizeng Zheng as our UMD ACM-ICPC team (with me as the coach) from the ACM ICPC Mid-Atlantic Regional contest **advanced to ACM-ICPC World Finals** (2013)
20. Hossein Esfandiari, Ang Li, and Shangfu Peng as our UMD ACM-ICPC team (with me as the coach) won the **“First to Solve Problem J Award” in ACM-ICPC World Finals**, as one of the only two awards given to ANY North American team this year (2013)
21. Rajesh Chitnis received **International Research Fellowship** by University of Maryland (2012)
22. Hossein Esfandiari, Ang Li, and Shangfu Peng as our UMD ACM-ICPC team (with me as the coach) **won the ACM ICPC Mid-Atlantic Regional contest** (ranked first) and thus **advanced to ACM-ICPC World Finals** (2012)
23. Catalin-Stefan Tiseanu received **International Fulbright Science & Technology Award** (2011)
24. Anu Bandi, Holman Gao, and Scott Zimmermann as our UMD ACM-ICPC team (with me as the coach) from the ACM ICPC Mid-Atlantic Regional contest **advanced to ACM-ICPC World Finals** (2010)
25. Hossein Bateni received **Charlotte Elizabeth Proctor Fellowship** (2010)

#### STUDENT INDUSTRIAL RESEARCH INTERNSHIPS

1. Mahsa Derakhshan: Google Research (2017, 2018)
2. Soheil Behnezhad: Upwork (2017, 2018)
3. Hadi Yami: Adobe Labs (2018)
4. Saeed Seddighin: Toyota Technological Institute at Chicago (2018)
5. Hadi Yami: Microsoft Research (2018)
6. Hossein Esfandiari: Google Research (2014, 2015, 2016)
7. Soheil Ehsani: Google Research (2016)
8. Sina Dehghani: Google Research (2016)
9. Saeed Seddighin: Google Research (2016)
10. Melika Abolhassani: Google Research (2016)
11. Sina Dehghani: Microsoft Research, UK (2015)
12. Soheil Ehsani: RocketFuel (2015)
13. Melika Abolhassani: e-Bay Research (2014)
14. Reza Khani: Google Research (2012, 2013, 2014), Microsoft Research, UK(2014)
15. Catalin-Stefan Tiseanu: Twitter (2012)
16. Vahid Liaghat: AT&T Labs Research (2011), Bell Labs (2012), Microsoft Research, Redmond (2013)
17. Rajesh Chitnis: Toyota Technological Institute at Chicago (2013)
18. Hossein Bateni: AT&T Labs Research (2008), Toyota Technological Institute at Chicago (2009), Microsoft Research, Cambridge (2010)

#### CURRENT PH.D. STUDENTS

1. Saeed Seddighin (*done with his Thesis Proposal on Nov 2015*)
2. Hadi Yami (*done with his Thesis Proposal on May 2018*)
3. Soheil Behnezhad (*done with his Thesis Proposal on May 2018*)
4. Mahsa Derakhshan (*done with her Thesis Proposal on May 2018*)
5. Alireza Farhadi
6. MohammadAmin Ghiasi
7. Hamed Saleh

#### PAST PH.D. STUDENTS

1. Soheil Ehsani (with Ph.D. thesis entitled “Online Decision-making via Prophet Setting”, now at *Uber*), 2017.
2. Hossein Esfandiari (with Ph.D. thesis entitled “Allocations in Large Markets”, 2017, a *post-doc at Harvard*, now at *Google Research*)

3. Sina Dehghani, (with Ph.D. thesis entitled “Network Design and Resource Management under Uncertainty”, 2017, joining as a *Research Scientist at Facebook*)
4. Melika Abolhassani (with Ph.D. thesis entitled “Allocation in Networks with Economic Applications”, 2016, joining *Google*)
5. Vahid Liaghat, (with Ph.D. thesis entitled “Primal-dual Techniques for Online Algorithms and Mechanisms”, 2015, a *post-doc at Stanford University*, and now a *Research Scientist at Facebook*)
6. Reza Khani, (with Ph.D. thesis entitled “Revenue Efficient Mechanisms for Online Advertising”, 2015, now at *Microsoft*)
7. Anshul Sawant (co-advised with Prof. V. S. Subrahmanian with Ph.D. thesis entitled “Computational Analysis of Intelligent Agents: Social and Strategic Settings”, 2015, now at *Google*).
8. Rajesh Chitnis, (with Ph.D. thesis entitled “Directed Graphs: Fixed-Parameter Tractability and Beyond”, 2014, a *post-doc at Weizmann Institute of Science*, now a *post-doc at University of Warwick*)
9. MohammadHossein Bateni (Ph.D. student at Princeton University that I mentored his thesis titled “A Primal-Dual Clustering Technique with Applications in Network Design”, 2011, now at *Google Research*)

#### PAST POST-DOCS

1. Elif Tan (Oct 2015-Oct 2016, now an *Assistant Professor at Ankara University*)
2. Hamid Mahini (Jul 2012-Mar 2015, now an *Assistant Professor at University of Tehran*)
3. David Malec (Jan 2013-Jun 2014, now a *Postdoc at Department of Economics, University of Maryland*)
4. Morteza Monemizadeh (Jan 2013-Mar 2013& Feb 2014-Aug 2014, *Assistant Professor at Charles University, Czech Republic*, now at *Amazon Research Labs*)
5. Marek Cygan (Jul 2011-Dec 2011, now an *Assistant Professor at University of Warsaw, Poland*)

#### PAST MASTER STUDENTS

1. Kevin Engel (without Master thesis, 2015, joining *Google*)
2. Catalin Stefan Tisceanu (with Master thesis titled “Promised Streaming Problems and Finding Pseudo-Repetitions”, 2013, joining *Twitter*)

#### LONG-TERM SUPPORTED PH.D. STUDENTS

1. Saeed Alaei (Aug 2011- Jan 2012, a *post-doc at Cornell University* and now at *Google Research*)

#### UNDERGRADUATE STUDENTS

- **Undergraduate at UMD:** Geoffrey Martin-Noble (UMD REU program mentee), Duncan Wilson (UMD REU program mentee), Anirudh Agarwal, Omar Ahsan, Anu Bandi (*now at Google*), Scott DellaTorre, Holman Gao, Steven Hill, Dylan Ladwig (*now at Facebook*), Rizeng Zheng (*now at Facebook*), and Scott Zimmermann.
- **Undergraduate at Sharif University:** Morteza Zadimoghaddam (became a Ph.D. student at MIT, *now at Google Research*), Shayan Oveisgharan (became a Ph.D. Student at Stanford, *now an Assistant Professor at University of Washington*), Mohammad Moharrami (became a Ph.D. student at University of Washington, *now at Facebook*), Amin S. Sayedi-Roshkhar (became a Ph.D. student at Carnegie Mellon University, *now an Assistant Professor at University of North Carolina at Chapel Hill*), Hamid Mahini (became a Ph.D. student at Sharif University, *now a Research Associate at University of Maryland*), and Nima Haghpanah (became a Ph.D. student at Northwestern University).

#### SUMMER STUDENTS AT AT&T:

Ankur Moitra (a Ph.D. student at MIT, *now an Assistant Professor at MIT*), 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)
8. Kanthi Kiran Sarpatwar (both)
9. Manish Purohit (both)
10. Rui Zhang (both; *Business School*)
11. David Harris (thesis; *Mathematics Department*)
12. Eric Raboin (thesis)
13. Ali Shafahi (proposal; *Civil Engineering*)
14. Utgoff, Naomi(thesis; *Economics Department*)
15. Chanhyun Kang (thesis)
16. Faezeh Dorri (proposal)
17. Srijan Kumar (proposal)
18. Mustafa Sahin (both; *Business School*)
19. Haomin Yan (thesis; *Economics Department*)

## TEACHING

Fall	2017	University of Maryland Under-graduate Course CMSC-351, <b>Introduction to Algorithms</b> . Rated <b>3.02/4.00</b> . Number of Students: 125. All course materials are available at <a href="http://www.cs.umd.edu/~soheil/cmssc351/">http://www.cs.umd.edu/~soheil/cmssc351/</a> .
Fall	2017	University of Maryland Under-graduate Course CMSC-474, <b>Introduction to Computational Game Theory</b> . Rated <b>2.94/4.00</b> . Number of Students: 36. All course materials are available at <a href="http://www.cs.umd.edu/~hajiagha/474GT17/GT17.html">http://www.cs.umd.edu/~hajiagha/474GT17/GT17.html</a> .
Fall	2015	University of Maryland Graduate Course CMSC-858F, <b>Network Design Foundation</b> . Rated <b>3.80/4.00</b> . Number of Students: 12. All course materials are available at <a href="http://www.cs.umd.edu/~hajiagha/NetDsgn11/courseNetworkDesign.html">http://www.cs.umd.edu/~hajiagha/NetDsgn11/courseNetworkDesign.html</a> .
Spring	2015	University of Maryland Under-graduate Course CMSC-474, <b>Introduction to Computational Game Theory</b> . Rated <b>3.52/4.00</b> . Number of Students: 45. All course materials are available at <a href="http://www.cs.umd.edu/~hajiagha/474GT13/GT13.html">http://www.cs.umd.edu/~hajiagha/474GT13/GT13.html</a> .
Fall	2014	[ <i>New developed course</i> ] University of Maryland Graduate Course CMSC-858F, <b>Algorithmic Lower Bounds: Fun with Hardness Proofs</b> . Rated <b>3.83/4.00</b> . Number of Students: 14. All course materials are available at <a href="http://www.cs.umd.edu/~hajiagha/ALB14/ALB14.html">http://www.cs.umd.edu/~hajiagha/ALB14/ALB14.html</a> .
Spring	2014	University of Maryland Graduate Course CMSC-858F, <b>Algorithmic Game Theory</b> . Rated <b>3.68/4.00</b> . Number of Students: 22. All course materials are available at <a href="http://www.cs.umd.edu/~hajiagha/AGT10/AGT14.html">http://www.cs.umd.edu/~hajiagha/AGT10/AGT14.html</a> .
Fall	2013	[ <i>New developed course</i> ] University of Maryland Under-graduate Course CMSC-474, <b>Introduction to Computational Game Theory</b> . Rated <b>2.93/4.00</b> . Number of Students: 44. All course materials are available at <a href="http://www.cs.umd.edu/~hajiagha/474GT13/GT13.html">http://www.cs.umd.edu/~hajiagha/474GT13/GT13.html</a> .
Spring	2012	University of Maryland Under-graduate Course CMSC-351, <b>Introduction to Algorithms</b> . Rated <b>3.13/4.00</b> . Number of Students: 86. All course materials are available at <a href="http://www.cs.umd.edu/~vliaghat/cmssc351/">http://www.cs.umd.edu/~vliaghat/cmssc351/</a> .
Fall	2011	University of Maryland Graduate Course CMSC-858F, <b>Network Design Foundation</b> . Rated <b>3.72/4.00 (Highest in CS Dep. in the semester)</b> . Number of Students: 14. All course materials are available at <a href="http://www.cs.umd.edu/~hajiagha/NetDsgn11/courseNetworkDesign.html">http://www.cs.umd.edu/~hajiagha/NetDsgn11/courseNetworkDesign.html</a> .
Spring	2011	[ <i>Updated course materials and created lecture notes</i> ] University of Maryland Under-graduate Course CMSC-351, <b>Introduction to Algorithms</b> . Rated <b>3.09/4.00</b> . Number of Students: 60. All course materials are available at <a href="http://www.cs.umd.edu/~vliaghat/cmssc351/">http://www.cs.umd.edu/~vliaghat/cmssc351/</a> .
Fall	2010	[ <i>New developed course</i> ] University of Maryland Graduate Course CMSC-858F, <b>Algorithmic Game Theory</b> . Rated <b>3.49/4.00</b> . Number of Students: 17. All course materials are available at <a href="http://www.cs.umd.edu/~hajiagha/AGT10.html">http://www.cs.umd.edu/~hajiagha/AGT10.html</a> .
Spring	2009	Rutgers University Graduate Course CS-514, <b>Advanced Algorithms: Top-</b>

ics in Game Theory, with Muthu Muthukrishnan and Aaron Jaggar. Rated **5.00/5.00**. Number of Students: 14. All course materials are available at <http://paul.rutgers.edu/~mangesh/cs514.html>.  
 Spring 2008 [*New developed course*] 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>.

#### GRANTS (TOTAL UMD SHARE: **\$3,699,500**)

Apr	2016–Aug	2017	DARPA SIMPLEX, “Stochastic Models of Knowledge Representation”, (PI) — \$250,000
Mar	2018–Feb	2019	AI in Business and Society Seed Grant, UMD, “Analyzing Data Streams with AI and Machine Learning”, (co-PI) — \$5,000
Dec	2015–Nov	2019	NSF IIS BIGDATA, “Making Big Data Accessible on Personal Devices: Big Network Algorithms, External Memory, and Data Streams”, (PI) — \$500,000
Feb	2014–Feb	2015	Google Faculty Research Award, “Towards Designing Revenue-Monotone Auctions for Online Advertising” (PI) — \$43,500
June	2013–May	2015	The Simons Foundation, “New Techniques and Applications of Parameterized Complexity”, (PI,) — \$48,000
Sep	2012–Aug	2016	DARPA GRAPHS, “Efficient Algorithmic Frameworks via Structural Graph Theory”, (PI), Other PI: Erik Demaine — \$1,000,000 (UMD portion)
Sep	2012–Aug	2017	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–Jun	2017	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–Jun	2017	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

#### BOOKS IN PREPARATION

I am currently writing a book, “Algorithmic Lower Bounds: Having Fun with Hardness” together with Erik Demaine and Bob Hearn.

#### RESEARCH INTERESTS AND PUBLICATION DOMAINS:

- **NetDsgn**: Network Design Algorithms
- **BIGData**: BIG Data
- **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.



## PUBLICATIONS

*I. Journal papers are specified by Ji at the beginning.*

*II. As it is conventional in CS theory, authors are in alphabetical order in our publications.*

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

*IV. Some papers are available online from <http://www.mit.edu/~hajiagha/index.html>.*

1. **{BIGData}** “Fast algorithms for knapsack via convolution and prediction”, (joint work MohammadHossein Bateni, Saeed Seddighin and Cliff Stein), in *Proceedings of the 50th Annual ACM Symposium on Theory of Computing (STOC)*, Los Angeles, CA, June 2018, to appear.
2. **{Game}** “Prophet secretary for combinatorial auctions and matroids” (joint work with Soheil Ehsani, Thomas Kesselheim, and Sahil Singla), in *Proceedings of the 29th Annual ACM-SIAM Symposium on Discrete Algorithms (SODA)*, New Orleans, LA, January 2018, pages 700–714.
3. **{Game}** “Envy-free chore division for an arbitrary number of agents” (joint work with Sina Dehghani, Alireza Farhadi, and Hadi Yami), in *Proceedings of the 29th Annual ACM-SIAM Symposium on Discrete Algorithms (SODA)*, New Orleans, LA, January 2018, pages 2564–2583.
4. **{Game}** “From battlefields to presidential elections: winning strategies of blotto and auditing games” (joint work with Soheil Behnezhad, Avrim Blum, Mahsa Derakhshan, Mohammad Mahdian, Christos H. Papadimitriou, Ronald L. Rivest, Saeed Seddighin, and Philip B. Stark), in *Proceedings of the 29th Annual ACM-SIAM Symposium on Discrete Algorithms (SODA)*, New Orleans, LA, January 2018, pages 2291–2310.
5. **{BIGData}** “Approximating edit distance in truly subquadratic time: Quantum and MapReduce.” (joint work with Mahdi Boroujeni, Soheil Ehsani, Mohammad Ghodsi, and Saeed Seddighin), in *Proceedings of the 29th Annual ACM-SIAM Symposium on Discrete Algorithms (SODA)*, New Orleans, LA, January 2018, pages 1170–1189.
6. **{Game}** “Spatio-temporal security games beyond one dimension”, (joint work with Soheil Behnezhad, Mahsa Derakhshan, and Saeed Seddighin), in *Proceedings of the 19th ACM Conference on Economics and Computation (EC)*, Ithaca, NY, June 2018, to appear.
7. **{Game}** “Frugal Auction Design for Set Systems: Vertex Cover and Knapsack”, (joint work with MohammadReza Khani and Saeed Seddighin), in *Proceedings of the 19th ACM Conference on Economics and Computation (EC)*, Ithaca, NY, June 2018, to appear.
8. **{Game}** “Fair allocation of indivisible goods: improvements and generalizations”, (joint work with Mohammad Ghodsi, Masood Seddighin, Saeed Seddighin, and Hadi Yami), in *Proceedings of the 19th ACM Conference on Economics and Computation (EC)*, Ithaca, NY, June 2018, to appear.
9. **{NetDsgn}** “Greedy algorithms for online survivable network design?” (joint work with Sina Dehghani, Soheil Ehsani, Vahid Liaghat, and Saeed Seddighin), in *Proceedings of the 45th International Colloquium on Automata, Languages and Programming (ICALP)*, Prague, Czech Republic, July 2018, to appear.
10. **{BIGData}** “MapReduce algorithms for massive trees” (joint work with MohammadHossein Bateni, Soheil Behnezhad, Mahsa Derakhshan, and Vahab Mirrokni), in *Proceedings of the 45th International Colloquium on Automata, Languages and Programming (ICALP)*, Prague, Czech Republic, July 2018, to appear.
11. **{Game}** “On the complexity of chore division”, (joint work with Alireza Farhadi), in *Proceedings of the 27th International Joint Conference on Artificial Intelligence (IJCAI)*, Stockholm, Sweden, July 2018, to appear.
12. **J1{NetDsgn}** “Improved approximation algorithms for (budgeted) node-weighted Steiner problems” (joint work with MohammadHossein Bateni and Vahid Liaghat), **SIAM Journal on Computing**, to appear. A preliminary version appeared in *Proceedings of the 40th International Colloquium on Automata, Languages and Programming (ICALP)*, Riga, Latvia, July 2013, pages 81–92.
13. **J2{NetDsgn}** “On maximum leaf trees and connections to connected maximum cut problems” (joint work with Rajiv Gandhi, Guy Kortsarz, Manish Purohit, Kanthi K. Sarpatwar ), **Information Processing Letters**, 129: 31–34 (2018).
14. **{BIGData}** “Affinity clustering: hierarchical clustering at scale”, (joint work MohammadHossein Bateni, Soheil Behnezhad, Mahsa Derakhshan, Raimondas Kiveris, Silvio Lattanzi, and Vahab Mirrokni), in *Proceedings of 31st Annual Conference on Neural Information Processing Systems (NIPS)*, Long Beach, CA, December 2017, pages 6867–6877.
15. **{Game}** “Beating 1-1/e for ordered prophets”, (joint work Melika Abolhassani, Soheil Ehsani, Hossein Esfandiari, Robert D. Kleinberg, and Brendan Lucier), in *Proceedings of the 49th Annual ACM Symposium on Theory of Computing (STOC)*, Montreal, Canada, June 2017, pages 61–71.



16. **{Game}** “A polynomial time algorithm for spatio-temporal security games”, (joint work with Soheil Behnezhad, Mahsa Derakhshan, and Aleksandrs Slivkins), in *Proceedings of the 18th ACM Conference on Economics and Computation (EC)*, Cambridge, MA, June 2017, pages 694–714.
17. **{Game}** “Stochastic  $k$ -server: how should Uber work?” (joint work with Sina Dehghani, Soheil Ehsani, Vahid Liaghat, and Saeed Seddighin), in *Proceedings of the 44th International Colloquium on Automata, Languages and Programming (ICALP)*, Warsaw, Poland, July 2017, pages 126:1–126:14.
18. **{Game}** “Faster and simpler algorithm for optimal strategies of Blotto game”, (joint work with Soheil Behnezhad, Sina Dehghani, Mahsa Derakhshan, and Saeedreza Seddighin), in *Proceedings of the 31st AAAI Conference on Artificial Intelligence (AAAI)*, San Francisco, CA, February 2017, pages 369–375.
19. **{Game}** “Market pricing for data streams”, (joint work with Melika Abolhassani, Hossein Esfandiari, Brendan Lucier, and Hadi Yami), in *Proceedings of the 31st AAAI Conference on Artificial Intelligence (AAAI)*, San Francisco, CA, February 2017, pages 291–297.
20. **{Game}** “Fair allocation of indivisible goods to asymmetric agents”, (joint work with Alireza Farhadi, Mohammad Ghodsi, Sebastien Lahaie, David M. Pennock, Masoud Seddighin, Saeed Seddighin, and Hadi Yami), in *Proceedings of the 16th International Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, Sao Paulo, Brazil, May 2017, pages 1535–1537.
21. **J3{NetDsgn}** “Online node-weighted Steiner forest and extensions via disk paintings” (joint work with Vahid Liaghat and Debmalya Panigrahi), **SIAM Journal on Computing**, 46(3): 911-935 (2017). A preliminary version appeared in *Proceedings of the 54th Annual IEEE Symposium on Foundations of Computer Science (FOCS)*, Berkeley, CA, October 2013.
22. **J4{Game}** “Prophet secretary”, (joint work with Hossein Esfandiari, Vahid Liaghat, and Morteza Monemizadeh), **SIAM Journal on Discrete Mathematics**, 31(3): 1685-1701, 2017. A preliminary version appeared in *Proceedings of the 23rd Annual European Symposium on Algorithms (ESA)*, Patras, Greece, September 2015, pages 496–508.
23. **J5{Misc}** “A greedy approximation algorithm for minimum-gap scheduling” (joint work with Marek Chrobak, Uriel Feige, Sanjeev Khanna, Fei Li, and Seffi Naor), **Journal of Scheduling**, 20(3): 279-292, 2017. A preliminary version appeared in *Proceedings of the 8th International Conference on Algorithms and Complexity (CIAC)*, Barcelona, Spain, May 2013, pages 97–109.
24. **J6{NetDsgn}** “A tight algorithm for strongly connected Steiner subgraph on two terminals with demands” (joint work with Rajesh Chitnis, Hossein Esfandiari, Rohit Khandekar, Guy Kortsarz and Saeedreza Seddighin), **Algorithmica**, 20(3): 279-292, 2017. A preliminary version appeared *Proceedings of the 9th International Symposium on Parameterized and Exact Computation (IPEC)*, Wroclaw, Poland, September 2014, pages 159–171.
25. **{NetDsgn}** “A PTAS for planar group Steiner tree via spanner bootstrapping and prize collecting” (joint work with MohammadHossein Bateni, Erik Demaine, and Daniel Marx), in *Proceedings of the 48th Annual ACM Symposium on Theory of Computing (STOC)*, Cambridge, MA, June 2016, pages 570–583.
26. **J7{NetDsgn}** “Designing FPT algorithms for cut problems using randomized contractions” (joint work with Rajesh Chitnis, Marek Cygan, Marcin Pilipczuk, and Michal Pilipczuk), **SIAM Journal on Computing**, 45(4): 1171-1229, 2016. A preliminary version appeared in *Proceedings of the 53rd Annual IEEE Symposium on Foundations of Computer Science (FOCS)*, New Brunswick, NJ, October 2012, pages 460–469.
27. **J8{NetDsgn}** “A constant factor approximation algorithm for fault-tolerant  $k$ -Median” (joint work with Wei Hu, Jian Li, Shi Li, and Barna Saha), **ACM Transactions on Algorithms**, 12(3): 36:1-36:19, 2016. A preliminary version appeared in *Proceedings of the 25th Annual ACM-SIAM Symposium on Discrete Algorithms (SODA)*, Portland, OR, January 2014, pages 1–12.
28. **J9{NetDsgn}** “Approximation algorithms for movement repairmen” (joint work with Rohit Khandekar, MohammadReza Khani, and Guy Kortsarz), **ACM Transactions on Algorithms**, 12(4): 54:1-54:38, 2016. A preliminary version appeared in *Proceedings of the 16th International Workshop on Approximation Algorithms for Combinatorial Optimization (APPROX)*, Berkeley, CA, August 2013, pages 218–232.
29. **J10{Game}** “Social network ad allocation and optimization: a geometric mapping-based approach”, (joint work with Hui Miao, Peixin Gao, and John Baras), **Social Network Analysis and Mining**, 6(1): 110:1-110:23, 2016. A preliminary version appeared in entitled “HyperCubeMap: optimal social network ad allocation using hyperbolic embedding” appeared in *Proceedings of the IEEE/ACM International Conference on Advances in Social Networks Analysis and Mining (ASONAM)*, Paris,

- France, August 2015, pages 357–362.
30. **{Game}** “Finding large matchings in semi-streaming” (joint work with Hossein Esfandiari and Morteza Monemizadeh), in *Proceedings of the IEEE International Conference on Data Mining (ICDM) Workshops*, San Francisco, CA, February 2016, pages 608–614.
  31. **{Game}** “From duels to battlefields: computing equilibria of blotto and other games” (joint work with Amirmahdi Ahmadi, Sina Dehghani, Brendan Lucier, Hamid Mahini, and Saeedreza Seddighin), in *Proceedings of the 30th AAAI Conference on Artificial Intelligence (AAAI)*, San Francisco, CA, February 2016, pages 376–382.
  32. **{BIGData,NetDsgn}** “Applications of uniform sampling: densest subgraph and beyond” (joint work with Hossein Esfandiari and David Woodruff), in *Proceedings of the 28th Annual ACM Symposium on Parallelism in Algorithms and Architectures (SPAA)*, Asilomar State Beach, CA, July 2016, short paper, pages 397–399.
  33. **{Game}** “Beating ratio 0.5 for weighted oblivious matching problems”, (joint work with Melika Abolhassani, T.-H. Hubert Chan, Fei Chen, Hossein Esfandiari, Hamid Mahini, Xiaowei Wu), in *Proceedings of the 24th Annual European Symposium on Algorithms (ESA)*, Aarhus, Denmark, August 2016, pages 3:1–3:18.
  34. **{Game}** “Price of competition and dueling games” (joint work with Sina Dehghani, Hamid Mahini and Saeedreza Seddighin), in *Proceedings of the 43rd International Colloquium on Automata, Languages and Programming (ICALP)*, Rome, Italy, July 2016, pages 21:1–21:14.
  35. **J11{NetDsgn}** “Bicovering: covering edges with two small subsets of vertices” (joint work with Amey Bhangale, Rajiv Gandhi, Rohit Khandekar, and Guy Kortsarz), **SIAM Journal on Discrete Mathematics**, 31(4): 2626–2646, 2017. A preliminary version appeared in *Proceedings of the 43rd International Colloquium on Automata, Languages and Programming (ICALP)*, Rome, Italy, July 2016, pages 6:1–6:12.
  36. **{NetDsgn}** “Online weighted degree-bounded Steiner networks via novel online mixed packing/covering” (joint work with Sina Dehghani, Soheil Ehsani, Vahid Liaghat, Harald Racke, and Saeed Seddighin), in *Proceedings of the 43rd International Colloquium on Automata, Languages and Programming (ICALP)*, Rome, Italy, July 2016, pages 42:1–42:14.
  37. **{BIGData,NetDsgn}** “Kernelization via sampling with applications to dynamic graph streams” (joint work with Rajesh Chitnis, Graham Cormode, Hossein Esfandiari, Andrew McGregor, Morteza Monemizadeh and Sofya Vorotnikova), in *Proceedings of the 27th Annual ACM-SIAM Symposium on Discrete Algorithms (SODA)*, Arlington, VA, January 2016, pages 1326–1344.
  38. **{NetDsgn}** “Online degree-bounded Steiner network design” (joint work with Sina Dehghani, Soheil Ehsani, Vahid Liaghat), in *Proceedings of the 27th Annual ACM-SIAM Symposium on Discrete Algorithms (SODA)*, Arlington, VA, January 2016, pages 164–175.
  39. **J12{NetDsgn}** “On fixed cost  $k$ -flow problems” (joint work with Rohit Khandekar, Guy Kortsarz, and Zeev Nutov), *A special issue of Theory of Computing Systems* 58(1): 4–18, 2016 for selected papers from WAOA 2013, pages 49–60. A preliminary version appeared in *Proceedings of the 11th Workshop on Approximation and Online Algorithms (WAOA)*, Sophia Antipolis, France, September 2013, pages 49–60.
  40. **{Game}** “Selling tomorrow’s bargains today” (joint work with Melika Abolhassani, Hossein Esfandiari, Hamid Mahini, David Malec, and Aravind Srinivasan), in *Proceedings of the 14th International Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, Istanbul, Turkey, May 2015, pages 337–345.
  41. **{Game}** “Forming external behaviors by leveraging internal opinions” (joint work with Amirmahdi Ahmadi, Sina Dehghani, Hamid Mahini, Saeedreza Seddighin, and Sadra Yazdanbod), in *Proceedings of the 34th Annual IEEE Conference on Computer Communications (INFOCOM)*, Hong Kong, April 2015, pages 1849–1857.
  42. **{BIGData,NetDsgn}** “Parameterized streaming: maximal matching and vertex cover” (joint work with Rajesh Chitnis, Graham Cormode, and Morteza Monemizadeh), in *Proceedings of the 26th Annual ACM-SIAM Symposium on Discrete Algorithms (SODA)*, San Diego, CA, January 2015, pages 1234–1251.
  43. **{BIGData,NetDsgn}** “Streaming algorithms for estimating the matching size in planar graphs and beyond” (joint work with Hossein Esfandiari, Vahid Liaghat, Morteza Monemizadeh and Krzysztof Onak), in *Proceedings of the 26th Annual ACM-SIAM Symposium on Discrete Algorithms (SODA)*, San Diego, CA, January 2015, pages 1217–1233.
  44. **{BIGData,NetDsgn}** “New streaming algorithms for parameterized maximal matching & beyond”

- (joint work with Rajesh Chitnis, Graham Cormode, Hossein Esfandiari, and Morteza Monemizadeh), in *Proceedings of the 27th Annual ACM Symposium on Parallelism in Algorithms and Architectures, (SPAA)*, Portland, OR, June 2015, short paper, pages 56–58.
45. **{Misc}** “FluTCHA: using fluency to distinguish humans from computers”, (joint work with Kotaro Hara and Benjamin B. Bederson), in *Proceedings of the 24th International Conference on World Wide Web (WWW)*, Florence, Italy, May 2015, short paper, pages 43–44.
  46. **{NetDsgn}** “Approximation algorithms for connected maximum cut and related problems”, (joint work with Guy Kortsarz, Robert MacDavid, Manish Purohit, and Kanthi Sarpatwar), in *Proceedings of the 23rd Annual European Symposium on Algorithms (ESA)*, Patras, Greece, September 2015, pages 693–704.
  47. **{Game}** “Revenue maximization for selling multiple correlated items”, (joint work with Mohammad-Hossein Bateni, Sina Dehghani, and Saeed Seddighin), in *Proceedings of the 23rd Annual European Symposium on Algorithms (ESA)*, Patras, Greece, September 2015, pages 95–105.
  48. **{NetDsgn}** “Approximate deadline-scheduling with precedence constraints”, (joint work with Hossein Esfandiari, Jochen Konemann, Hamid Mahini, David Malec, and Laura Sanita), in *Proceedings of the 23rd Annual European Symposium on Algorithms (ESA)*, Patras, Greece, September 2015, pages 483–495.
  49. **J13{Game}** “Automated generation of counter-terrorism policies using multi-expert input” (joint work with John Dickerson, Anshul Sawant, and V.S. Subrahmanian), **ACM Transactions on Intelligent Systems and Technology**, 6(4): 44, 2015.
  50. **J14{NetDsgn}** “Directed subset feedback vertex set is fixed-parameter tractable” (joint work with Rajesh Chitnis, Marek Cygan, and Daniel Marx), **ACM Transactions on Algorithms**, 11(4): 28, 2015. A preliminary version appeared in *Proceedings of the 39th International Colloquium on Automata, Languages and Programming (ICALP)*, Warwick, UK, July 2012, pages 230–241.
  51. **J15{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, 55(3): 613-636, 2014. A preliminary version appeared in *Proceedings of the 23rd Annual ACM Symposium on Parallelism in Algorithms and Architectures, (SPAA)*, San Jose, CA, June 2011, pages 269–278.
  52. **J16{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**, 10(3): 13, 2014. 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.
  53. **{Misc}** “Online stochastic reordering buffer scheduling” (joint work with Hossein Esfandiari, MohammadReza Khani, Vahid Liaghat, Hamid Mahini, and Harald Räcke), in *Proceedings of the 41st International Colloquium on Automata, Languages and Programming (ICALP)*, Copenhagen, Denmark, July 2014, pages 465–476.
  54. **{NetDsgn}** “Near-optimal online algorithms for prize-collecting Steiner problems” (joint work with Vahid Liaghat and Debmalya Panigrahi), in *Proceedings of the 41st International Colloquium on Automata, Languages and Programming (ICALP)*, Copenhagen, Denmark, July 2014, pages 576–587.
  55. **{Game}** “The polarizing effect of network influences” (joint work with Hamid Mahini and David L. Malec), in *Proceedings of the 15th ACM Conference on Economics and Computation (EC)*, Palo Alto, CA, June 2014, pages 131–148.
  56. **{NetDsgn}** “Hierarchical graph partitioning” (joint work with Theodore Johnson, MohammadReza Khani, and Barna Saha), in *Proceedings of the 26th Annual ACM Symposium on Parallelism in Algorithms and Architectures, (SPAA)*, Prague, Czech Republic, June 2014, pages 51–60.
  57. **{Game}** “Network Cournot competition” (joint work with Melika Abolhassani, MohammadHossein Bateni, Hamid Mahini, and Anshul Sawant), in *Proceedings of the 10th International Conference on Web and Internet Economics (WINE)*, Beijing, China, December 2014, pages 15–29.
  58. **{Game}** “Randomized revenue monotone mechanisms for online advertising” (joint work with Gagan Goel and MohammadReza Khani), in *Proceedings of the 10th International Conference on Web and Internet Economics (WINE)*, Beijing, China, December 2014, pages 324–337.
  59. **{Game}** “How to influence people with partial incentives” (joint work with Erik D. Demaine, Hamid Mahini, David L. Malec, S. Raghavan, Anshul Sawant, Morteza Zadimoghaddam), in *Proceedings of the 23rd International Conference on World Wide Web (WWW)*, Seoul, Korea, April 2014, pages

- 937–948.
60. **{Game}** “How effectively can we form opinions?” (joint work with Amirmahdi Ahmadi, Sina Dehghani, Hamid Mahini, Saeed Seddighin, Sadra Yazdanbod), in *Proceedings of the 23rd International Conference on World Wide Web (WWW)*, Seoul, Korea, April 2014, short paper, pages 213–214.
  61. **J17{Wireless,Robotics}** “Minimizing movement: fixed-parameter tractability” (joint work with Erik D. Demaine and Daniel Marx), **ACM Transactions on Algorithms**, 11(2): 14, 2014. 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 regrettably declined.
  62. **J18{NetDsgn}** “A constant factor approximation algorithm for fault-tolerant  $k$ -Median” (joint work with Wei Hu, Jian Li, Shi Li, and Barna Saha), **ACM Transactions on Algorithms**, 12(3): 36:1–36:19, 2016. A preliminary version appeared in *Proceedings of the 25th Annual ACM-SIAM Symposium on Discrete Algorithms (SODA)*, Portland, OR, January 2014, pages 1–12.
  63. **{NetDsgn}** “Tight bounds for planar strongly connected Steiner subgraph with fixed number of terminals (and extensions)” (joint work Rajesh Chitnis and Daniel Marx), in *Proceedings of the 25th Annual ACM-SIAM Symposium on Discrete Algorithms (SODA)*, Portland, OR, January 2014, pages 1782–1801.
  64. **J19{Wireless}** “Efficient and practical resource block allocation for LTE-based D2D network via graph coloring” (joint work with Mahdi Hajiaghayi, Carl Wijting, and Cassio Ribeiro), **Wireless Networks**, 20(4): 611–624, 2014.
  65. **J20{Game}** “Correction: Basic network creation games” (joint work with Noga Alon, Erik D. Demaine, Panagiotis Kanellopoulos, and Tom Leighton), **SIAM Journal on Discrete Mathematics**, 28(3): 1638–1640, 2014.
  66. **J21{Game}** “Basic network creation games” (joint work with Noga Alon, Erik D. Demaine, and Tom Leighton), **SIAM Journal on Discrete Mathematics**, 27(2): 656–668, 2013. A preliminary version appeared in *Proceedings of the 22nd Annual ACM Symposium on Parallelism in Algorithms and Architectures, (SPAA)*, Santorini, Greece, June 2010, pages 106–113. **This paper is the winner of Best Paper Award in SPAA 2010.**
  67. **{NetDsgn}** “PACE: policy-aware application cloud embedding” (joint work with Li Erran Li, Vahid Liaghat, Hongze Zhao, Dan Li, Gordon T. Wilfong, Yang Richard Yang, and Chuanxiong Guo), in *Proceedings of the 32nd Annual IEEE Conference on Computer Communications (INFOCOM)*, Torino, Italy, April 2013, pages 638–646.
  68. **{Game}** “A game-theoretic model motivated by the DARPA network challenge” (joint work with Rajesh Chitnis, Jonathan Katz, and Koyel Mukherjee), in *Proceedings of the 25th Annual ACM Symposium on Parallelism in Algorithms and Architectures, (SPAA)*, Montreal, Canada, July 2013, pages 115–118.
  69. **{Game}** “Scheduling a cascade with opposing influences” (joint work with Hamid Mahini and Anshul Sawant), in *Proceedings of the 6th International Symposium on Algorithmic Game Theory (SAGT)*, Aachen, Germany, October 2013, pages 195–206.
  70. **J22{Misc}** “Scheduling to minimize gaps and power consumption” (joint work with Erik D. Demaine, Mohammad Ghodsi, Amin S. Sayedi-Roshkar, and Morteza Zadimoghaddam), **Journal of Scheduling**, 16(2): 151–160, 2013. A preliminary version appeared in *Proceedings of the 19th Annual ACM Symposium on Parallelism in Algorithms and Architectures, (SPAA)*, San Diego, CA, June 2007, pages 46–54.
  71. **{Game}** “The online stochastic generalized assignment problem” (joint work with Saeed Alaei and Vahid Liaghat), in *Proceedings of the 16th International Workshop on Approximation Algorithms for Combinatorial Optimization (APPROX)*, Berkeley, CA, August 2013, pages 11–25.
  72. **{Game}** “PREVE: A policy recommendation engine based on vector equilibria applied to reducing LeT’s attacks” (joint work with John Dickerson, Anshul Sawant, and V.S. Subrahmanian), *Proceedings of the IEEE/ACM International Conference on Advances in Social Networks Analysis and Mining (ASONAM)*, Niagara Falls, Canada, August 2013, pages 1084–1091.
  73. **{NetDsgn}** “Fixed-parameter and approximation algorithms: a new look” (joint work with Rajesh Chitnis and Guy Kortsarz), *Proceedings of the 8th International Symposium on Parameterized and Exact Computation (IPEC)*, Sophia Antipolis, France, September 2013, pages 110–122.
  74. **J23{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**, 42(4): 1674–1696, 2013. A preliminary version appeared in *Proceedings of the 23rd Annual ACM-*



- SIAM Symposium on Discrete Algorithms (SODA)*, Kyoto, Japan, January 2012, pages 1713–1725.
75. **J24{Game}** “Submodular secretary problem and extensions” (joint work with MohammadHossein Bateni and Morteza Zadimoghaddam), **ACM Transactions on Algorithms**, 9(4): 32, 2013. A preliminary version appeared in *Proceedings of the 13th International Workshop on Approximation Algorithms for Combinatorial Optimization (APPROX)*, Barcelona, Spain, September 2010, pages 39–52.
  76. **J25{PlanarNet,NetDsgn}** “Euclidean prize-collecting Steiner forest” (joint work with MohammadHossein Bateni), **Algorithmica**, 62(3-4): 906–929, 2012. A preliminary version appeared in *Proceedings of the 9th Latin American Symposium on Theoretical Informatics (LATIN)*, Oaxaca, Mexico, April 2010, pages 503–514.
  77. **J26{NetDsgn}** “The checkpoint problem” (joint work with Rohit Khandekar, Guy Kortsarz, and Julian Mestre), **Theoretical Computer Science**, 452: 88–99, 2012. A preliminary version appeared in *Proceedings of the 13th International Workshop on Approximation Algorithms for Combinatorial Optimization (APPROX)*, Barcelona, Spain, September 2010, pages 219–231.
  78. **J27{NetDsgn}** “Designing FPT algorithms for cut problems using randomized contractions” (joint work with Rajesh Chitnis, Marek Cygan, Marcin Pilipczuk, and Michal Pilipczuk), **SIAM Journal on Computing**, 45(4): 1171-1229, 2016. A preliminary version appeared in *Proceedings of the 53rd Annual IEEE Symposium on Foundations of Computer Science (FOCS)*, New Brunswick, NJ, October 2012, pages 460–469.
  79. **{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.
  80. **{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.
  81. **{Wireless}** “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 Kossefi), in *Proceedings of the 31st Annual IEEE Conference on Computer Communications (INFOCOM)*, Orlando, FL, March 2012, pages 1350–1358.
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163. **J73{PlanarNet}** “Approximation algorithms for classes of graphs excluding single-crossing graphs as minors” (joint work with Erik D. Demaine, Naomi Nishimura, Prabhakar Ragde, and Dimitrios M. Thilikos), **Journal of Computer and System Sciences**, 69(2): 166–195, 2004.



164. **J74**{**PlanarNet**} “Diameter and treewidth in minor-closed graph families, revisited” (joint work with Erik D. Demaine), **Algorithmica**, 40(3): 211–215, 2004.
165. **J75**{**Misc**} “Random MAX SAT, random MAX CUT, and their phase transitions” (joint work with Don Coppersmith, David Gamarnik, and Gregory B. Sorkin), A *special issue* of **Random Structures and Algorithms**, 24(4): 502–545, 2004. A preliminary version appeared in *Proceedings of the 14th Annual ACM-SIAM Symposium on Discrete Algorithms (SODA)*, Baltimore, Maryland, January 2003, pages 364–373.
166. **J76**{**Routing**} “Characterization of networks supporting multi-dimensional linear interval routing schemes” (joint work with Yashar Ganjali), **Theoretical Computer Science**, 326(1–3): 103–116, 2004.
167. **J77**{**NetDsgn**} “On the bounded fragmentation property and its applications” (joint work with Mahdi Hajiaghayi), **European Journal of Combinatorics**, 24(7): 891–896, 2003. A preliminary version appeared in *Proceedings of Euroconference on Combinatorics, Graph Theory and Applications (Euro-COMB)*, September 2003.
168. **J78**{**NetDsgn**} “The facility location problem with general cost functions” (joint work with Mohammad Mahdian and Vahab S. Mirrokni), **Networks**, 42(1): 42–47, 2003.
169. **J79**{**Misc**} “Palindrome recognition using a multidimensional tape” (joint work with Therese C. Biedl, Jonathan F. Buss, Erik D. Demaine, Martin L. Demaine, and Tomáš Vinař), **Theoretical Computer Science**, 302(1–3): 475–480, 2003.
170. {**Misc**} “The satisfiability threshold of random 3-SAT is at least 3.52” (joint work with Gregory B. Sorkin), in *arXiv:math.CO/0310193 v2 22*, October 2003. See also IBM Research Report RC22942, 2003.
171. **J80**{**Robotics**} “RoboCup-2001: The fifth robotic soccer world championships” (joint work with Manuela M. Veloso, Tucker R. Balch, Peter Stone, Hiroaki Kitano, Fuminori Yamasaki, Ken Endo, Minoru Asada, Mansour Jamzad, Bashir S. Sadjad, Vahab S. Mirrokni, Moslem Kazemi, Hamid R. Chitsaz, A. Heydarnoori, and Ehsan Chiniforooshan), **AI Magazine**, 23(1): 55–68, 2002.
172. **J81**{**Misc**} “A note on the consecutive ones submatrix problem” (joint work with Yashar Ganjali), **Information Processing Letters**, 83(3): 163–166, 2002.
173. {**Robotics**} “Simple, fast, and robust self-localization in environments similar to the Robocup environment” (joint work with Mansour Jamzad), in *Proceedings of the 18th International Conference on CAD/CAM, Robotics and Factories of the future (CARS&FOF)*, Porto, Portugal, July 2002, Vol 2, pages 513–522.
174. {**PlanarNet**} “1.5-Approximation for treewidth of graphs excluding a graph with one crossing as a minor” (joint work with Erik D. Demaine and Dimitrios M. Thilikos), in *Proceedings of the 5th International Workshop on Approximation Algorithms for Combinatorial Optimization Problems (APPROX)*, Rome, Italy, September 2002, pages 67–80.
175. **J82**{**Routing**} “Path-matching in graphs with length constraints” (joint work with Mohammad Ghodsi, Mohammad Mahdian, and Vahab S. Mirrokni), **Networks**, 39(4): 210–215, 2002.
176. **J83**{**PlanarNet**} “Fast approximation schemes for  $K_{3,3}$ -minor-free or  $K_5$ -minor-free graphs” (joint work with Naomi Nishimura, Prabhakar Ragde, and Dimitrios M. Thilikos), **Electronic Notes in Discrete Mathematics**, 10, 2001. A preliminary version appeared in *Proceedings of Euroconference on Combinatorics, Graph Theory and Applications (EuroCOMB)*, September 2001.
177. {**Robotics**} “A fast vision system for middle size robots in RoboCup” (joint work with Mansour Jamzad, Bashir S. Sadjad, Vahab S. Mirrokni, Moslem Kazemi, Hamid R. Chitsaz, Abbas HeydarNoori, and Ehsan Chiniforooshan), in *Proceedings of the RoboCup 2001 International Symposium*, Seattle, Washington, August 2002, LNCS 2377, pages 71–80. This paper won **The Best Engineering Challenge Award**.
178. {**Robotics**} “A goal keeper for middle size RoboCup” (joint work with Mansour Jamzad, Amirali Foroughnassiraei, Vahab S. Mirrokni, Reza Ghorbani, Abbas Heydar Noori, Moslem Kazemi, Hamid R. Chitsaz, Farid Mobasser, Mohsen E. Moghaddam, Maziar Gudarzi, Navid Ghaffarzadegan), in *Proceedings of the RoboCup 2000 International Symposium*, Melbourne, Australia, August 2001, LNCS 2019, pages 583–586.
179. **J84**{**Misc**} “On the simultaneous edge-coloring conjecture” (joint work with Ebadollah S. Mahmoodian, Vahab S. Mirrokni, Amin Saberi, and Ruzbeh Tusserkani), **Discrete Mathematics**, 216(1–3): 267–272, 2000.

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.

**A few workshops on our Bidimensionality Theory (the topic of my thesis):**

- (a) FOCS 2013 Workshop on Bidimensional Structures: Algorithms and Combinatorics, October 2013.
- (b) Seminar on Bidimensional Structures: Algorithms, Combinatorics, and Logic, Schloss Dagstuhl, Germany, March 2013.
- (c) Seminar on Fixed-Parameter and Approximation Algorithms, Schloss Dagstuhl, Germany, December 2009.
- (d) School on Algorithmic Graph Structure Theory, Berlin, Germany, October 2007.

**Also the theory received European Association for Theoretical Computer Science (EATCS) Nerode Prize, 2015 as a cornerstone in the field of multivariate algorithms.**

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*, Encyclopedia of Algorithms, pages 133-137, Springer, 2016.
2. Mohammad Taghi Hajiaghayi, Hamid Mahini: *Bargaining Networks*, Encyclopedia of Algorithms, pages 174–177, Springer, 2016.
3. Fedor V. Fomin, Erik D. Demaine, Mohammad Taghi Hajiaghayi: *Bidimensionality*, Encyclopedia of Algorithms, pages 203-207, Springer, 2016.
4. Erik D. Demaine, Mohammad Taghi Hajiaghayi, Hamid Mahini, Morteza Zadimoghaddam: *Network Creation Games*, Encyclopedia of Algorithms, pages 1408–1412, Springer, 2016.
5. Mohammad Taghi Hajiaghayi, Vahid Liaghat: *Prophet Inequality and Online Auctions*, Encyclopedia of Algorithms, pages 1634–1636, Springer, 2016.
6. Rajesh Hemant Chitnis, Mohammad Taghi Hajiaghayi: *Shadowless Solutions for Fixed-Parameter Tractability of Directed Graphs*, Encyclopedia of Algorithms, pages 1963–1966, Springer, 2016.
7. Erik D. Demaine, MohammadTaghi Hajiaghayi: *Approximation Schemes for Planar Graph Problems*, Encyclopedia of Algorithms, pages 59-62, Springer, 2008.
8. Erik D. Demaine, MohammadTaghi Hajiaghayi: *Bidimensionality*, Encyclopedia of Algorithms, pages 88-90, Springer, 2008.

PATENTS

1. **Minimizing staleness in real-time data warehouses**,  
*US Patent 8,856,071 granted Oct 7, 2014*, Co-inventor(s): MohammadHossein Bateni, Lukasz Golab, and Howard Karloff.
2. **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.
3. **Network aware forward caching II**,  
*US Patent 8,671,197 granted Mar 11, 2014*, Co-inventor(s): Jeffrey Erman, Alexandre Gerber, Dan Pei, and Oliver Spatscheckwith.
4. **Designing minimum total cost networks using iterative rounding approximation methods**,  
*US Patent 8,238,251 granted Aug 7, 2012*.
5. **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.
6. **Network aware forward caching I**,  
*US Patent 8,312,141 granted Nov 13, 2012*, Co-inventor(s): Jeffrey Erman, Alexandre Gerber, Dan Pei, and Oliver Spatscheckwith.
7. **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.
8. **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.

9. **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.
10. **Mechanism which allows trading digital goods with no incentive for buyers to sell the good for their own profit or reshare it**,  
Provisional US Patent 62/215,157, granted Sep 7, 2015, Co-inventor(s): Melika Abolhassani.
11. **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.
12. **Generalized deadlock resolution in databases**,  
Pending patent with application number 11/271,130, Filed November 2005, Co-inventor(s): Kamal Jain and Kunal Talwar.
13. **Optimal social network Ad allocation using hyperbolic embedding**,  
Pending patent with application number A1/20170352061, Filed December 2017, Co-inventor(s): John S. Baras, Peixin Gao, and Hui Miao.

#### INVITED TALKS AT RESEARCH INSTITUTIONS AND UNIVERSITIES (71 TALKS)

- May. 2018 “Online Decision-making: Prophets & Secretaries”, Flexible Network Design Workshop, College Park, MD.
- Apr. 2018 “Online Decision-making: Prophets & Secretaries”, Airbnb, San Francisco, CA.
- Jan. 2018 “Online Decision-making: Prophets & Secretaries”, Amazon, Seattle, CA.
- Dec. 2017 “Online Decision-making: Prophets & Secretaries”, Dynamic Pricing Workshop, Santiago de Chile, Chile.
- Dec. 2017 “Online Decision-making: Prophets & Secretaries”, Simons Institute for the Theory of Computing, Berkeley, CA.
- Dec. 2017 “Online Decision-making: Prophets & Secretaries”, Simons Institute for the Theory of Computing, Berkeley, CA.
- Jun. 2017 “Algorithm Design and Learning for Real-world”, Uber, Pittsburgh, PA.
- Jun. 2017 “Parameterized and Promised Streaming: Making Big Data More Accessible”, NII Shonan Center, Japan.
- May. 2017 “From Presidential Elections to Battlefields: Computing Optimal Strategies in Blotto, Security, and Other Games”, Google Research, Mountain View, CA.
- Mar. 2017 “From Presidential Elections to Battlefields: Computing Optimal Strategies in Blotto, Security, and Other Games”, Columbia Computer Science Department, New York City, NY.
- Oct. 2016 “From Presidential Elections to Battlefields: Computing Equilibria of Blotto and Other Games”, UC Berkeley Industrial Engineering and Operations Research Department, Berkeley, CA.
- Sep. 2016 “Algorithm Design with Knowledge: Secretaries and Prophets”, Distinguished talk at Computer Engineering’s 30th Anniversary and Sharif University’s 50th Anniversary, Sharif University of Technology, Tehran.
- Jul. 2016 “From Duels to Battlefields: Computing Equilibria of Blotto and Other Games”, Flexible Network Design Workshop, Amsterdam, Netherlands.
- May. 2016 “From Duels to Battlefields: Computing Equilibria of Blotto and Other Games”, Johns Hopkins University, Baltimore, MD.
- Dec. 2015 “Parameterized and Promised Streaming: Making Big Data More Accessible”, Microsoft Research, New York City, NY.
- Dec. 2015 “Parameterized and Promised Streaming: Making Big Data More Accessible”, Microsoft Research, New York City, NY.
- Nov. 2015 “Approximability and Fixed-Parameter Tractability: Survey of Connections”, Banff International Research Station, Alberta, Canada.
- Nov. 2015 “Parameterized and Promised Streaming: Making Big Data More Accessible”, Simons Institute for the Theory of Computing, Berkeley, CA.
- Oct. 2015 “Parameterized and Promised Streaming: Making Big Data More Accessible”, Charles University, Prague, Czech Republic.
- Oct. 2015 “Parameterized and Promised Streaming: Making Big Data More Accessible”, University of Maryland, College Park, MD.
- Sep. 2015 “Parameterized and Promised Streaming: Making Big Data More Accessible”, Google Research, New York City, NY.
- Jun. 2015 “The Price of Anarchy in Basic Network Creation Games”, ACM EC’15 Tutorial, Portland, OR.

- Apr. 2015 “Parameterized and Promised Streaming: Matching and Vertex Cover”, Johns Hopkins University, Baltimore, MD.
- Nov. 2014 “Parameterized and Promised Streaming: Matching and Vertex Cover”, University of Pennsylvania, Philadelphia, PA.
- Nov. 2014 “Parameterized Streaming: Matching and Vertex Cover”, Optimality and Tight Results in Parameterized Complexity Workshop, Dagstuhl, Germany.
- Jul. 2014 “Near-optimal Online Algorithms for Prize-Collecting Steiner Problems”, Flexible Network Design Workshop, Lugano, Switzerland.
- May 2014 “Fixed-Parameter and Approximation Algorithms: A New Look”, Workshop on Frontiers and Connections between Parametrization and Approximation, Bertinoro, Italy.
- Nov. 2013 “Contraction and Minor Graph Decomposition and Their Algorithmic Applications”, IBM T.J. Watson Research Center, Yorktown, NY.
- Nov. 2013 “Contraction and Minor Graph Decomposition and Their Algorithmic Applications”, Microsoft Research, Redmond, WA.
- Oct. 2013 “Contraction and Minor Graph Decomposition and Their Algorithmic Applications”, **FOCS 2013 Tutorial on THE THEORY THAT I FOUNDED IN MY PH.D. THESIS, namely Bidimensional Structures: Algorithms and Combinatorics**, Berkeley, CA.
- Oct. 2013 “Online Node-weighted Steiner Forest in Planar Graphs and Extensions”, Algorithms for Optimization Problems in Planar Graphs, Dagstuhl, Germany.
- Jul. 2013 “Online Node-Weighted Steiner Forest and Extensions via Disk Paintings”, Flexible Network Design Workshop, Fields Institute, Toronto, Canada.
- 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.

## EDITORIAL WORK

1. Editor, **SIAM Journal on Discrete Mathematics**, 2016–present.
2. Editor, **Algorithmica**, 2014–present.
3. Editor, **Networks**, 2016–present.
4. Editor, **Algorithms**, 2008–present.
5. Editor, **Encyclopedia of Algorithms**, 2013–2016.
6. Editor, **ISRN Discrete Mathematics**, 2013–2014
7. Guest editor, Special Issue of Selected Papers from ESA 2013, **Algorithmica**.
8. Guest editor, Special Issue of Selected Papers from SODA 2008, **ACM Transactions on Algorithms (TALG)**.
9. Guest editor, Special Issues of Selected Papers from SPAA 2017, **ACM Transactions on Parallel Computing (TOPC)**.

## CONFERENCE AND WORKSHOP COMMITTEES

1. Program Committee, the 27th International Joint Conference on Artificial Intelligence (IJCAI), Stockholm, Sweden, July 2018.

2. Program Committee, the 29th International Symposium on Algorithms and Computation (ISAAC), Jiaoxi, Taiwan, December 2018.
3. Program Committee, the 24th International Computing and Combinatorics Conference (COCOON), Qingdao, China, July 2018.
4. Technical program committee, the 36th Annual IEEE International Conference on Computer Communications (INFOCOM), Honolulu, HI, April 2018.
5. Co-organizer, the 9th Workshop on Flexible Network Design, College Park, MD, May 2018.
6. **Chair of program committee**, the 29th Annual ACM Symposium on Parallel Algorithms and Architectures (SPAA), Washington, DC, July 2017.
7. Program committee, the 28th Annual ACM-SIAM Symposium on Discrete Algorithms (SODA), Barcelona, Spain, January 2017.
8. Program committee, the 31st IEEE International Parallel and Distributed Computing Conference (IPDPS), Orlando, FL, June 2017.
9. Technical program committee, the 36th Annual IEEE International Conference on Computer Communications (INFOCOM), Atlanta, GA, May 2017.
10. Program committee, the 2nd International Conference on Topics in Theoretical Computer Science (TTCS), Tehran, August 2017.
11. Program committee, the 22nd Annual International Computing and Combinatorics Conference (COCOON), Ho Chi Minh, Vietnam, August 2016.
12. Program committee, the 10th International Conference on Language and Automata Theory (LATA), Prague, Czech, March 2016.
13. Technical program committee, the 35th Annual IEEE International Conference on Computer Communications (INFOCOM), San Francisco, CA, April 2016.
14. Co-organizer, Capital Area Theory Day, Baltimore, MD, May 2016.
15. Co-organizer: ACM Conference in Economics and Computation (EC) 2015 Tutorial on “Network Creation Games: How Does the Internet Form?”, Portland, OR, June 2015.
16. Program committee, the 27th Annual ACM Symposium on Parallel Algorithms and Architectures (SPAA), Portland, OR, 2015.
17. Program committee, the 42nd International Colloquium on Automata, Languages and Programming (ICALP), Kyoto, Japan, July 2015.
18. Technical program committee, the 34th Annual IEEE International Conference on Computer Communications (INFOCOM), Hong Kong, April 2015.
19. **Co-chair of program committee**, The First International Conference on Topics in Theoretical Computer Science (TTCS), Tehran, August 2015.
20. Program committee, the 9th International Workshop on Algorithms and Computation (WALCOM), Bangladesh, February 2015.
21. Program committee, the 15th ACM Conference on Economics and Computation (ACM EC), Palo Alto, CA, June 2014.
22. Technical program committee, the 33rd Annual IEEE International Conference on Computer Communications (INFOCOM), Toronto, Canada, April 2014.
23. Co-organizer, FOCS 2013 Workshop on Bidimensional Structures: Algorithms and Combinatorics, Berkeley, CA, October 2013.
24. Program committee, the 45th ACM Symposium on Theory of Computing, (STOC), Stanford, CA, June 2013.
25. Program committee, the 21st European Symposium on Algorithms (ESA), Sophia Antipolis, France, September 2013.
26. Program committee, the 16th International Workshop on Approximation Algorithms for Combinatorial Optimization Problems (APPROX), Berkeley, CA, August 2013.
27. Technical program committee, the 32nd Annual IEEE International Conference on Computer Communications (INFOCOM), Turin, Italy, April 2013.
28. Program committee, the 2nd International Conference on Advances in Computing, Communications, and Informatics (ICACCI), Chennai, India, August 2013.
29. Program committee, the 8th Workshop on Internet & Network Economics, (WINE), Liverpool, UK, December 2012.
30. Co-organizer, Seminar on Bidimensional Structures: Algorithms, Combinatorics and Logic, Schloss Dagstuhl, Germany, March 2013.
31. Technical program committee, the 31th Annual IEEE International Conference on Computer Commu-

- nications, (INFOCOM), Orlando, FL, April 2012.
32. Program committee, the 23st Annual ACM Symposium on Parallel Algorithms and Architectures, (SPAA), San Jose, CA, June 2011.
  33. Co-organizer, Workshop on Approximation Algorithms: The Last Decade and the Next, Princeton, NJ, June 2011.
  34. Program committee, the 16th Annual International Computing and Combinatorics Conference (COCOON), Nha Trang, Vietnam, July 2010.
  35. Co-organizer, Seminar on Fixed-Parameter and Approximation Algorithms, Schloss Dagstuhl, Germany, December 2009.
  36. Organizing Network Design and Algorithms Session, INFORMS, San Diego, CA, October 2009.
  37. Program committee, the 19th Annual ACM-SIAM Symposium on Discrete Algorithms (SODA), San Francisco, CA, January 2008.
  38. Program committee, International Workshop on Parameterized and Exact Computation (IWPEC), Victoria, Canada, May 2008.
  39. Organizing Network Design Session, INFORMS, Washington, DC, October 2008.
  40. Program committee, International Conference on Wireless Algorithms (WASA), Dallas, TX, USA, October 2008.
  41. Organizing Optimization in Wireless Networks Session, INFORMS, Pittsburgh, PA, November 2006.
  42. Program committee, the 2nd ACIS International Workshop on Self-Assembling Wireless Networks (SAWN), Las Vegas, Nevada, June 2006.
  43. Program committee, the 11th International CSI Computer Conference (CSICC), Tehran, January 2006.

#### PANELS AND GRANT REVIEWS

1. Review for Research Grants Council of Hong Kong, 2018.
2. Review for Israel Science Foundation, 2018.
3. Panelist for NSF CCF Algorithmic Foundation, February 2017.
4. Review for Research Grants Council of Hong Kong, 2017.
5. Review for Israel Science Foundation, 2017.
6. Review for European Research Council (ERC), 2016.
7. Panelist for NSF CCF Algorithmic Foundation, February 2016.
8. Panelist for NSF CCF Algorithmic Foundation, January 2015.
9. Panelist for NSF CCF Algorithmic Foundation, November 2014.
10. Panelist for NSF CCF Algorithmic Foundation, March 2014.
11. Review for European Research Council (ERC) 2014.
12. Panelist for NSF CCF Algorithmic Foundation, October 2011.
13. Review for Israel Science Foundation, 2011.
14. Review for Research Grants Council of Hong Kong, 2007.

#### DEPARTMENT AND UNIVERSITY SERVICE AT UMD

1. Member, UMD Graduate Faculty Mentor of the Year Award Committee, 2018.
2. Member, UMD Capital One Search Committee, 2018.
3. Chair of Field Committee, Algorithms and Theory of Computing Group, 2015-2016.
4. Member, CMSC Graduate Admission Committee, 2011-2018.
5. Faculty Member of University of Maryland Student Honor Council, 2012-2018.
6. Member, University of Maryland Senate Educational Affairs Committee, June 2013–May 2015.
7. University of Maryland ACM Faculty Representative, 2012-2017.
8. Organizer, Weekly Capital Area Theory Seminar (CATS), Fall 2010- Spring 2014.
9. Member, Organizing Committee of the 40th Anniversary of UMD CS Department, 2013.
10. Member, CMSC Committee to Review PhD Proposals and MS Scholarly Papers, 2013.
11. Coach, University of Maryland ACM-ICPC Programming Contest Team, 2010-2018. **Our team advanced six times to World Finals in 2010, 2012, 2013, 2014, 2016, 2017 and won Mid-Atlantic ACM-ICPC Regional contest in 2012. The team was ranked 27 and won the “First to Solve Problem J Award” in World Finals held in June 2013. The team was ranked 64 in World Finals held in May 2015 and ranked 56 in World Finals held in May 2017..**
12. Member, CS EduTech Working Group, 2012.
13. Member, University of Maryland High School Programming Committee, 2011-2017.

14. CS Faculty Representative, CMNS Scholarship Interview Reception, March 7, 2012.
15. Faculty Speaker, CMNS Undergraduate Recruiting Day, March 30, 2012.
16. Member, CMNS Committee for Recruiting of Highly Talented Undergrads, 2012.
17. Member, Revising Mandatory Undergrad Algorithms Courses (CMSC 250&351) Committee, 2011.

#### COMMUNITY ENGAGEMENTS AND SERVICE

1. Elected Board Member of Silverton Condominium (with 210 Condos), Silver Spring, MD, 2014–2017.

#### SOFTWARE IN PUBLIC DOMAIN

BigDND: Big Dynamic Network Data): Networks are everywhere, and there is an increasing amount of data about networks viewed as graphs: nodes and edges/connections. But this data typically ignores a third key component of networks: time. This repository provides **free, big datasets for real-world networks** viewed as a dynamic (multi)graph, with two types of temporal data:

1. A timeseries of *instantaneous edge events*, such as messages sent between people. Many such events can occur between the same pair of nodes.
2. Timestamped *edge insertions and edge deletions*, such as friending and defriending in a social network. Generally only one such edge can exist at any specific time, but the same edge can be added and deleted multiple times.

See <http://projects.csail.mit.edu/dnd/> for more details.

Ranking of CS Departments based on the Number of Papers in Theoretical Computer Science We feel there is a lack of transparency and well-defined measures in the methods used by U.S. News to rank CS departments in theoretical computer science (and other similar rankings). Over the past several months we have developed a ranking based on a hard, measurable method for the top 50 U.S. universities. See <http://projects.csail.mit.edu/dnd/ranking/> for more details.

#### SERVED AS REFEREE

**Journals:** Journal of the ACM, SIAM Journal on Computing, SIAM Journal on Discrete Mathematics, Combinatorica, Mathematics of Operation Research, Operations Research, Games and Economic Behavior, 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), The International Conferences on Theory and Applications of Satisfiability Testing (SAT).

**PROFESSIONAL MEMBERSHIPS**

Association for Computing Machinery (ACM)

IEEE Computer Society, **Senior Member**

European Association for Theoretical Computer Science (EATCS)

American Mathematical Society (AMS)

Society for Industrial and Applied Mathematics (SIAM)

**SOFTWARE SKILLS**

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

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