Mohammad Hossein BATENI

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Research Interests

- ◇ (Combinatorial) Optimization, Approximation algorithms, Hardness of approximation
- ◇ Network design, Mobile computing, Network management
- ◇ Algorithmic game theory, Market algorithms, Fair allocation, Bargaining games

Education

Princeton University, Princeton, New Jersey.
Ph.D. in Computer Science; advisor: Prof. Moses Charikar; Fall 2006 - June 2011 (degree: September 2011).
Thesis: a primal-dual clustering technique with applications in network design
General exam with Profs. Moses Charikar, Sanjeev Arora and Robert Tarjan (Spring 2008)
Master of Arts degree in Computer Science, September 2008.
Courses and exams **(GPA: 4.0/4.0)**: Adv. Algs, Data Structs & Graph Algs, Algeb. Methods in Combinatorics, Design of Prog. Langs, AI, Inf. Security, Approx. Algs & Complexity, Comp. Networks, Complexity Theory, Network Design & Game Theory, Cryptography, Theorist's toolkit, Algs & Complexity.

Sharif University of Technology, Tehran, Iran. September 2002 - April 2006
B.Sc. in Computer Engineering, **GPA: 18.5/20**; Thesis: *Plane Embedding of Planar Graph Metrics.*
Relevant Coursework **(GPA 19.69/20)**: Prog., Discr. Maths, Data Structs & Algs, Theory of Computation, Comp. Networks, OS, Compilers, Comp. Arch., Modern Inf. Retrieval; Grad: Quantum Comp., Parallel Proc., Combinatorial Optimization.

Honors and Awards

- ◇ **Charlotte Elizabeth Procter Fellow**, September 2010 to August 2011
- ◇ **Gordon Wu Fellow**, Fall 2006 to Summer 2010
- ◇ ACM-ICPC: International Collegiate Programming Contest
  - · Co-coach of **2nd Team** in Regional Contest (Greater NY), Union, NJ – Fall 2007
    ranked **13th** in World Finals, Alberta, Canada – Spring 2008
  - · **1st Team** in Regional Contest, Tehran, Iran – Falls 2003 and 2004
    4th Place in IBM Parallel Challenge, Shanghai, China – Spring 2005
    16th Place in Java Challenge, Prague, Czech Rep. – Spring 2004
    17th Team in World Finals, Shanghai, China – Spring 2005
    Honorable Mention in World Finals, Prague, Czech Rep. – Spring 2004
  - · **3rd Team** in Regional Contest, Tehran, Iran – Fall 2002
- ◇ IOI: International Olympiad in Informatics
  - · **Gold Medal** in International Olympiad in Informatics (IOI) 2002, in South Korea
  - · **Bronze Medal** in Central European Olympiad in Informatics (CEOI) 2002, in Slovakia
  - · **Gold Medal** in Iranian National Olympiad in Informatics, 2001
- ◇ Ranked **2nd** in class of 2002 (more than 100 students), Sharif University of Technology, Sep 2005
- ◇ Awarded as **Outstanding Student** by university president, 2002, 2003 and 2005

Research

- ◇ **Summer Internship in Microsoft Research—New England** Summer 2010
  Mentor: Dr. Niv Buchbinder – working on "Resource allocation," "Hiring," and "Ad-auction" problems.
- ◇ **Research Visit to Toyota Technological Institute at Chicago** March 2010
  working on "Buffer reordering," "Planar embedding," and "Bin packing" problems.
- ◇ **Summer Internship in Toyota Technological Institute at Chicago** Summer 2009
  Mentor: Dr. Julia Chuzhoy – working on "Job Scheduling," "ATSP," and "Orienteering" problems.

◇ **Research Collaborator with AT&T Labs.—Research**; since Fall 2008
Working in Algorithms and Theoretical Computer Science group on Steiner Network problems.

◇ **Summer Internship in AT&T Labs. – Research** Summer 2008
Mentor: Dr. MohammadTaghi Hajiaghayi – working on "VPN Network Design," "Optimzing Cache Server Allocation for Anycast" and "Scheduling Database updates."

◇ **Research Assistantship in Princeton University** since Spring 2007
Advisor: Professor Moses Charikar – working on "Fair Allocation of Indivisible Goods."

Service

◇ **Referee** for FOCS, SODA, CSICC, IWPEC, SWAT, ICALP, ICCCT, APPROX, SAGT, COCOON, IPCO, Discrete Mathematics Journal, Algorithmica, ACM Transactions on Algorithms, IEEE/ACM Transactions on Networking, SIAM Journal on Computing, SIAM Journal on Discrete Mathematics, and Journal of Parallel and Distributed Computing.

◇ **Invited talks** in AT&T Labs – Research (Florham Park, NJ) '08, '09; IBM Watson Research Center (Yorktown Heights, NY) '09; DIMACS Theoretical Computer Science Seminar '09; Center for Computational Intractability '09; ISMP '09; INFORMS Annual Meeting '09; University of Chicago '10; Toyotal Technological Institute '10; MIT '10; University of Maryland at College Park '10; Stanford University '11; CMU '11.

◇ **Teaching**

· T.A. for the courses "Reasoning About Computation" (Moses Charikar, Bernard Chazelle) and "Theory of Algorithms" (Bob Tarjan) – Princeton University

· T.A. for the courses Discrete Mathematics (Spring 2003), Data Structure and Algorithmics (Fall 2002, 2003), Design and Analysis of Algorithms (Spring 2004), Introduction to the Theory of Computation (Fall 2003, Spring 2004) – Sharif University of Technology

· Teaching the "Computer Workshop" course (Fall 2004): Intro to Linux, MS Windows, Network, Web, PHP, HTML, Scripting (Bourne Shell, `awk`, `sed`), LaTeX, FarsiTeX, etc. – Sharif University of Technology

◇ **ACM-ICPC**

· Co-coach of Princeton ACM-ICPC team, Fall 2006 - Summer 2008

· Member of Scientific Commitee, ACM-ICPC Regional Contest, Fall 2005

· Coordinator of Sharif UT ACM-ICPC Training sessions, Fall 2005 and Winter 2006.

· Scientific Chairman and System Manager for holding Iran's 2nd and 3rd Nationwide Programming Contests, 2004 and 2005.

◇ **IOI**

· Deputy Leader of Iranian Team in IOI, Summer 2005, Poland

· Head of Summer Camp at Young Scholars' Club, Summer 2004

· Member of the Scientific Commitee at Young Scholars' Club, July 2002 - Sep 2006

· Member of the National Commitee at Young Scholars' Club, Oct 2003 - Oct 2005

· Scientific Chairman and System Manager for holding the 1st Norouz Contest, Spring 2006

Skills

◇ Proficient in C, Pascal, Java, C++, ASM and LaTeX.

◇ Familiar with CGI, HTML, PHP, SQL, J2EE.

Test Scores

SPEAK (Sep 2006): 50/60.

TOEFL (Sep 2005): Computer-Based Test **280/300**
Listening (28/30), *Structure* (28/30), *Reading* (28/30), *Writing* (5.5/6.0).

GRE General (Sep 2005): *Analytical* (5.0/6.0), *Verbal* (470/800), *Quantitative* (800/800).

GRE Subject in Computer Science (Nov 2005): 880/900, percentile: 98%

Publications and Working Papers

1. M. Bateni, E. Demaine, M. Hajiaghayi, M. Moharrami, *Plane Embedding of Planar Graph Metrics*, SOCG 2006.

2. M. Bateni, E. Demaine, M. Hajiaghayi, M. Moharrami, *Plane Embedding of Planar Graph Metrics*, Journal of Discrete and Computational Geometry 38(3): 615-637 (2007).

3. M. Bateni, M. Hajiaghayi, *Assignment problem in content distribution networks: unsplittable hard-capacitated facility location*, SODA 2009.

4. M. Bateni, A. Gerber, M. Hajiaghayi, S. Sen, *Multi-VPN Optimization for Scalable Routing via Relaying*, INFOCOM 2009.

5. M. Bateni, M. Charikar, V. Guruswami, *MaxMin allocation via degree lower-bounded arborescences*, STOC 2009.

6. M. Bateni, L. Golab, M. Hajiaghayi, H. Karloff, *Minimizing Staleness and Stretch in Real-Time Data Warehouses*, SPAA 2009.

7. A. Archer, M. Bateni, M. Hajiaghayi, H. Karloff, *Improved Approximation Algorithms for Prize-Collecting Steiner Tree and TSP*, FOCS 2009.

8. M. Bateni, M. Hajiaghayi, *A note on the subadditive network design problem*, Operations Research Letters, 37(5): 339-344 (2009).

9. M. Bateni, M. Hajiaghayi, *Euclidean Prize-collecting Steiner Forest*, LATIN 2010.

10. M. Bateni, D. Marx, M. Hajiaghayi, *PTASs for Steiner forest in planar graphs and graphs of bounded treewidth*, STOC 2010.

11. M. Bateni, M. Hajiaghayi, N. Immorlica, H. Mahini, *Cooperative game theory foundations of network bargaining games*, ICALP 2010.

12. M. Bateni, M. Hajiaghayi, M. Zadimoghaddam, *The submodular secretary problem and its extensions*, APPROX 2010.

13. M. Bateni, J. Chuzhoy, *Tours and strolls in directed networks*, APPROX 2010.

14. M. Bateni, A. Gerber, M. Hajiaghayi, S. Sen, *Multi-VPN Optimization for Scalable Routing via Relaying*, IEEE Transactions on Networking, 15(3): 1544-1556.

15. M. Bateni, M. Hajiaghayi, *Assignment problem in content distribution networks: unsplittable hard-capacitated facility location*, ACM Transactions on Algorithms, to appear.

16. M. Bateni, C. Chekuri, A. Ene, M. Hajiaghayi, N. Korula, D. Marx, *Prize-collecting Steiner problems on planar graphs*, SODA 2011.

17. M. Bateni, L. Golab, M. Hajiaghayi, H. Karloff, *Minimizing Staleness and Stretch in Real-Time Data Warehouses*, Theory of Computing Systems, to appear.

18. M. Bateni, M. Hajiaghayi, S. Jafarpour, D. Pei, *Towards an efficient algorithmic framework for pricing cellular data service*, INFOCOM 2011.

19. M. Bateni, M. Hajiaghayi, *Euclidean Prize-collecting Steiner Forest*, Algorithmica, to appear.

20. A. Archer, M. Bateni, M. Hajiaghayi, H. Karloff, *Improved Approximation Algorithms for Prize-Collecting Steiner Tree and TSP*, SIAM Journal on Computing.

21. M. Bateni, D. Marx, M. Hajiaghayi, *PTASs for Steiner forest in planar graphs and graphs of bounded treewidth*, Journal of the ACM, to appear.

22. M. Bateni, M. Hajiaghayi, P. Klein, C. Mathieu, *Polynomial time approximation scheme for planar multiway cut*, submitted.

23. M. Bateni, M. Hajiaghayi, *Approximation algorithms for the net worth problem*, under preparation.

24. M. Bateni, M. Charikar, V. Guruswami, *New Approximation Algorithms for Degree Lower-bounded Arborescences and Max-Min Allocation*, under preparation.

PATENTS

- ◇ System and Method for Assigning Requests in a Content Distribution Network, pending U.S. Patent with application number 12/329,454; filed Dec. 2008, coinventor: M. Hajiaghayi.
- ◇ Minimizing Staleness in Real-time Data Warehouses, pending U.S. Patent with application number 12/539,429; filed Aug. 2009, coinventors: L. Golab, M. Hajiaghayi, H. Karloff.
- ◇ Methods and Apparatus to implement Scalable Routing in Network Communication Systems, pending U.S. Patent with application number 12/563,815; filed Oct. 2009, coinventors: A. Gerber, M. Hajiaghayi, S. Sen.