

MOHIT SINGH

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Microsoft Research, New England
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Work Experience

Post-Doctoral Researcher
Microsoft Research
July 2008 - Present
Cambridge, USA

Summer Intern
Microsoft Research
May 2007 - August 2007
May 2006 - August 2006
Redmond, USA

Education

PhD in Algorithms, Combinatorics and Optimization(ACO)
Tepper School of Business, Carnegie Mellon University
August 2003 - May 2008
Pittsburgh, PA

Thesis Title: Iterative Methods in Combinatorial Optimization.

Bachelor of Technology in Computer Science and Engineering
Indian Institute of Technology
August 1999 - May 2003
Delhi, India
GPA: 9.0/10.

Research Interests

Theoretical Computer Science, Combinatorial Optimization, Approximation Algorithms.

I am interested in designing efficient algorithms for hard combinatorial optimization problems. My focus has been to design approximation algorithms for basic network design problems. I am also interested in studying models which deal with uncertainty in data including online algorithms, stochastic and robust optimization.

Teaching Experience

Designed and co-taught the graduate course *Special Topics in Combinatorial Optimization*. Duties involved designing the curriculum of the course, delivering lectures, designing and grading assignments.
Carnegie Mellon University
August 2007 - October 2007
Pittsburgh, PA

Teaching Assistant for graduate courses.
Carnegie Mellon University
Probability and Decision Making, Fall 2004, Spring 2006.
Statistics and Decision Making, Fall 2004.
Graph Theory, Fall 2005.
Network Flow and Matching Algorithms, Fall 2005.
Pittsburgh, PA

Refereed Publications

1. *Set Covering with Our Eyes Closed*. Fabrizio Grandoni, Anupam Gupta, Stefano Leonardi, Pauli Miettinen, Piotr Sankowski and Mohit Singh. In Proceedings of 49th Annual IEEE Symposium on Foundations of Computer Science, FOCS 2008: 347-356.
2. *Edge Coloring and Decompositions of Weighted Graphs*. Uriel Feige and Mohit Singh. In Proceedings of European Symposium on Algorithms, ESA 2008: 405-416.
3. *Degree Bounded Matroids and Submodular Flows*. Tamás Király, Lap Chi Lau and Mohit Singh. In Proceedings of Integer Programming and Combinatorial Optimization, IPCO 2008: 259-272.
4. *Additive Approximation for Bounded Degree Survivable Network Design*. Lap Chi Lau and Mohit Singh. In Proceedings of 40th ACM Symposium on Theory of Computing, STOC 2008: 759-768.
5. *Approximating Minimum Bounded Degree Spanning Trees to within one of the Optimal*. Mohit Singh and Lap Chi Lau. In Proceedings of 39th ACM Symposium on Theory of Computing, STOC 2007: 661-670.
6. *Survivable Network Design with Degree or Order Constraints*. Lap Chi Lau, Joseph (Seffi) Naor, Mohammad Salavatipour and Mohit Singh. In Proceedings of 39th ACM Symposium on Theory of Computing, STOC 2007: 651-660.
7. *Improved Approximation Ratios for Traveling Salesperson Tours and Paths in Directed Graphs*. Uriel Feige and Mohit Singh. In Proceedings of 10th International Workshop on Approximation Algorithms for Combinatorial Optimization Problems, APPROX 2007: 104-118.
8. *Delegate and Conquer: An LP-based Approximation Algorithm for Minimum Degree MSTs*. R. Ravi and Mohit Singh. In Proceedings of 33rd International Colloquium on Automata, Languages and Programming, ICALP 2006: 169-180.
9. *Approximating the k -Multicut Problem*. Daniel Golovin, Viswanath Nagarajan and Mohit Singh. In Proceedings of ACM-SIAM Symposium on Discrete Algorithms, SODA 2006: 621-630.
10. *How to Pay, Come What May: Approximation Algorithms for Demand-Robust Covering Problems*. Kedar Dhamdhere, Vineet Goyal, R. Ravi and Mohit Singh, In Proceedings of 46th Annual IEEE Symposium on Foundations of Computer Science, FOCS 2005: 367-378.
11. *On Stochastic Minimum Spanning Trees*. Kedar Dhamdhere, R. Ravi and Mohit Singh. In Proceedings of Eleventh Conference on Integer Programming and Combinatorial Optimization, IPCO 2005: 321-334.
12. *On the Crossing Spanning Tree Problem*. Vittorio Bilo, Vineet Goyal, R. Ravi and Mohit Singh. In Proceedings of 7th International Workshop on Approximation Algorithms for Combinatorial Optimization Problems, APPROX 2004: 51-60.

Selected Talks

1. *Iterative methods in Combinatorial Optimization*.

Georgia Tech ACO seminar, October 2007,
INFORMS Annual Meeting, November 2007,
McGill Computer Science Seminar, February 2008,
U. Mass Computer Science Seminar, April 2008,
University of Toronto Computer Science Seminar, May 2008,
Microsoft Research, India, June 2008,
Flexible Network Design Workshop, Warwick, July 2008,
ITCS China Theory Week, Beijing, September 2008,
Theory Seminar, University of California, Berkeley, November 2008.

2. *Approximating the Minimum Bounded Degree Spanning Tree.*
 CMU ACO seminar March 2007,
 MIT Theory Seminar March 2007,
 Princeton Theory Seminar April 2007,
 IIT Delhi Computer Science Seminar May 2007.
3. *Edge-Coloring Weighted Graphs.*
 European Symposium of Algorithms, Karlsruhe, September 2008,
 INFORMS, Washington DC, October 2008.
4. *Set Covering with Our Eyes Closed.*
 Microsoft Research Theory Seminar, Redmond, October 2008,
 IEEE Symposium on Foundations of Computer Science, Philadelphia, October 2008.
5. *LP-based approximations for Minimum Bounded Degree Spanning Tree problem*
 Microsoft Research Theory Seminar March 2006,
 CMU Theory Lunch April 2006.

Professional Activities

External reviewer for journals including Mathematics of Operations Research, SIAM Journal of Discrete Mathematics, Information Processing Letters, Networks, Transactions on Algorithms.

Refereed papers for several conferences and workshops including ACM Symposium on Theory of Computing (STOC), IEEE Symposium on Foundations of Computer Science (FOCS), International Workshop on Approximation Algorithms for Combinatorial Optimization Problems (APPROX), ACM-SIAM Symposium on Discrete Algorithms (SODA), International Colloquium on Automata, Languages and Programming (ICALP).

- Achievements**
- Egon Balas Award for best Summer Paper, Tepper School of Business, 2004.
 - William Larimer Mellon Fellow 2003-2006, Carnegie Mellon University.
 - Bronze Medal in International Mathematics Olympiad IMO 1999 held at Romania.
 - Awarded National Talent Search Scholarship by NCERT in 1997.

References

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 Department of Mathematics
 Massachusetts Institute of Technology
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Prof. Gerard Cornuejols
 Tepper School of Business,
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Prof. Anupam Gupta
 School of Computer Science
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