

MOHIT SINGH

Work Address

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Education

Carnegie Mellon University Pittsburgh, PA
2003-Present (Expected Graduation: May 2008)

PhD Candidate in Algorithms, Combinatorics and Optimization(ACO) at Tepper School of Business.

Thesis Title: Iterative Methods in Combinatorial Optimization.

Indian Institute of Technology Delhi, India
1999-2003

Bachelor of Technology in Computer Science and Engineering. GPA: 9.0/10.

Research Interests

Combinatorial Optimization, Approximation Algorithms.

My research lies at the intersection of operations research, computer science and discrete mathematics. In particular, I have been working on constrained network design problems where the goal is to obtain general algorithmic techniques which can give strong guarantees for a large class of constraints and network design requirements.

Teaching Experience

Carnegie Mellon University Pittsburgh, PA
August 2007 - October 2007

I designed and co-taught the graduate course *47-853: Special Topics in Combinatorial Optimization*. Duties involved designing the curriculum of the course, delivering lectures, designing and grading assignments.

Carnegie Mellon University Pittsburgh, PA
Fall 2005, Spring 2006

Teaching Assistant for graduate courses *45-730: Probability and Decision Making*, *45-731: Statistics and Decision Making*, *Graph Theory* and *Network Flow and Matching Algorithms*.

Work Experience

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

As a summer intern I worked on algorithms for edge-coloring problems and travelling salesperson problems on directed graphs.

Refereed Publications

1. *Approximating Minimum Bounded Degree Spanning Trees to within one of the Optimal*. Mohit Singh and Lap Chi Lau. Proceedings of 39th ACM Symposium on Theory of Computing, STOC 2007.

2. *Survivable Network Design with Degree or Order Constraints*. Lap Chi Lau, Joseph (Seffi) Naor, Mohammad Salavatipour and Mohit Singh. Proceedings of 39th ACM Symposium on Theory of Computing, STOC 2007.
3. *Improved Approximation Ratios for Travelling Salesperson Tours and Paths in Directed Graphs*. Uriel Feige and Mohit Singh. Proceedings of 10th International Workshop on Approximation Algorithms for Combinatorial Optimization Problems, APPROX 2007.
4. *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.
5. *Approximating the k -Multicut Problem*. Daniel Golovin, Viswanath Nagarajan and Mohit Singh, Proceedings of ACM-SIAM Symposium on Discrete Algorithms, SODA 2006: 621-630.
6. *How to Pay, Come What May: Approximation Algorithms for Demand-Robust Covering Problems*. Kedar Dhamdhere, Vineet Goyal, R. Ravi and Mohit Singh, Proceedings of 46th Annual IEEE Symposium on Foundations of Computer Science, FOCS 2005: 367-378.
7. *On Stochastic Minimum Spanning Trees*. Kedar Dhamdhere, R. Ravi and Mohit Singh, Proceedings of Eleventh Conference on Integer Programming and Combinatorial Optimization, IPCO 2005: 321-334.
8. *On the Crossing Spanning Tree Problem*. Vittorio Bilo, Vineet Goyal, R. Ravi and Mohit Singh, Proceedings of 7th International Workshop on Approximation Algorithms for Combinatorial Optimization Problems, APPROX 2004: 51-60.
9. *On an Extremal Problem related to a Theorem of Whitney*. Mohit Singh and Amitabha Tripathi. Discrete Applied Mathematics, Volume 155, Issue 4, Pages 579-583, 2007.

Working Papers and Technical Reports

1. *Additive Approximations for Degree Bounded Network Design*, L. C. Lau and Mohit Singh, Manuscript 2007.
2. *A Swap-Relabel Algorithm for Matroid Intersection*, Nick Harvey and Mohit Singh, Manuscript 2006.
3. *A $5/4$ -Approximation for the 2-Edge Connected Subgraph Problem on Hamiltonian Graphs*. Naveen Garg, Akash M Kushal, Vineet Goyal and Mohit Singh, Technical Report, IIT Delhi, 2003.

Selected Talks

1. *Iterative methods in Combinatorial Optimization*.
Georgia Tech ACO seminar, October 2007, INFORMS Annual Meeting, November 2007.
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. *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).

Skills Proficiency in C, C++, SML.

- 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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Prof. Alan Frieze
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