Ravishankar Krishnaswamy

CONTACT INFORMATION

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Computer Science Department
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INTERESTS

Approximation Algorithms, Combinatorial Optimization, Algorithmic Game Theory.

EDUCATION

Carnegie Mellon University (Aug 2007 -)

Ph.D Candidate, Computer Science Department
Advisor: Prof. Anupam Gupta

Indian Institute of Technology Madras (Aug 2003 - May 2007)

B.Tech, Computer Science Department

PUBLICATIONS

1. Tree Embeddings for 2-Edge-Connected Network Design
(with Anupam Gupta and R. Ravi). SODA 2010
2. A Constant Factor Approximation Algorithm for Generalized Min-Sum Set Cover
(with Nikhil Bansal and Anupam Gupta). SODA 2010
3. Online and Stochastic Survivable Network Design
(with Anupam Gupta and R. Ravi). STOC 2009. Invited to the SICOMP special issue
4. Scheduling with Outliers
(with Anupam Gupta, Amit Kumar and Danny Segev). APPROX 2009

MANUSCRIPTS

1. Better Scalable Algorithms for Broadcast Scheduling
(with Nikhil Bansal and Viswanath Nagarajan). Submitted
2. Scheduling Jobs with Varying Parallelizability to Reduce Variance
(with Anupam Gupta, Sungjin Im, Benjamin Moseley and Kirk Pruhs). Submitted
3. Isolate and Conquer: Adaptive Approximation Algorithms
(with Anupam Gupta and Viswanath Nagarajan and R. Ravi). Manuscript

RESEARCH EXPERIENCE

Computer Science Department, Carnegie Mellon University
Graduate Research — Oct 2007 - Present

Working with Prof. Anupam Gupta and Prof. R. Ravi on approximation algorithms for generalized network design and scheduling problems. Our recent focus has been on Steiner network problems with higher connectivity requirements, like the online version of Survivable Network Design, 2-connected versions of Group Steiner Tree, Facility Location, Buy-at-Bulk, etc.

In other ongoing work with Prof. Anupam Gupta and Prof. Kirk Pruhs, we are looking at some online scheduling problems with the objective of minimizing the sum of flow time and total energy, when the power could be an arbitrary function of the speed. We have preliminary results for some restricted settings of job sizes and weights.

IBM T. J. Watson Research Center, Yorktown Heights
Summer Internship — June 2009 - Aug 2009

Worked with Dr. Nikhil Bansal and Dr. Viswanath Nagarajan on problems related to broadcast scheduling. We looked at the problem of broadcasting pages to minimize the average flow time of requests which arrive online, and obtained a simple algorithm with near optimal competitive ratio.

Computer Science Department, IIT Madras
B.Tech Thesis — Dec 2006 - Apr 2007

Worked with Prof. C. Pandu Rangan on network coding. We designed centralized algorithms that attain optimal throughput even when a constant number of edges stop transmitting. Our work was accepted for presentation at the 2007 STOC student research competition.

College of Comp. and Info. Sciences, Northeastern University
Undergraduate Internship — May 2006 - July 2006

Worked with Prof. Ravi Sundaram on the problem of bundling goods to maximize revenue (under the model that buyers buy any bundle as long as its price is at most their valuation). We obtained hardness results and approximation algorithms for the combinatorial problems, and analyzed the existence of Nash equilibria for some game theoretic formulations.

Teaching Experience

- 15-251 Fall 2008 (CMU): Great Ideas in Theoretical Computer Science (TA).
- CS110 Spring 2006 (IITM): Introduction to Computer Science (TA).

Courses

Carnegie Mellon University
Advanced Approximation Algorithms, Iterative Rounding and Relaxation, Machine Learning Theory, Networks and Matchings, Complexity Theory, Probabilistic Combinatorics* (*$^*audit$)

IIT Madras
Randomized Algorithms, Advanced Operations Research, Graph Theory, Linear Algebra

Awards and Honors

- Ranked 2^{nd} among all students in the Computer Science Department, IIT Madras
- Secured 11^{th} place in the 2006 ACM-ICPC Asia Regional Programming Contest Finals

Miscellanea

- Designed and organized the first ever IIT Madras online programming contest in 2006.

References

Prof. Anupam Gupta
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Prof. R. Ravi
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Dr. Nikhil Bansal
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Prof. Kirk Pruhs
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