

Nikhil R. Devanur

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Education

- **Ph.D in Computer Science**, Georgia Institute of Technology.
Expected date of graduation: Aug 2007.
Advisor: Prof. Vijay Vazirani.
Thesis topic: Algorithmic Aspects of Game Theory and Economics.
- **Bachelor of Technology (Computer Science)**, July 2001. Indian Institute of Technology, Bombay, India.

Academic Awards

- Awarded **Dean's Fellowship**, 2001-2002. College of Computing, Georgia Institute of Technology.

Research Interests

Algorithmic Game theory and Economics: Computation of Equilibria and Mechanism Design. Approximation Algorithms and Combinatorial Optimization. Computational aspects of Social Networks.

Selected Publications

- New Geometric Relaxations for the Steiner Tree Problem and their Algorithmic Consequences, with Deeparnab Chakrabarty, and Vijay Vazirani. *Under review* .
- Market Equilibrium via a Primal-Dual-Type Algorithm, with Christos H. Papadimitriou, Amin Saberi and Vijay V. Vazirani. In Proceedings of The IEEE Symposium on Foundations of Computer Science, *FOCS 2002*.

- Integrality Gaps for Sparsest Cut and Minimum Linear Arrangement Problems, with Subhash A. Khot, Rishi Saket and Nisheeth K. Vishnoi. In proc. of The ACM Symposium on Theory of Computing, *STOC 2006*.
- The Spending Constraint Model for Market Equilibrium: Algorithmic, Existence and Uniqueness results, with Vijay V. Vazirani. In Proc. of The ACM Symposium on Theory of Computing, *STOC 2004*.

Invited Talks

- Market Equilibrium: Algorithms for the Linear Case, in *Dagstuhl Seminar on Algorithmic Game Theory and the Internet*, July 2003.
- Price of Anarchy, Locality Gap, and a Network Service Provider Game in *INFORMS*, Denver, 2004.
- Market Equilibrium: Models and Algorithms, at *Cornell Theory Seminar*, March 2006.
- New Geometric Relaxations for the Steiner Tree Problem and their Algorithmic Consequences, in the *Stanford Algorithms Seminar*, November 2006.

Research and Teaching Experience

- Research Assistant for Vijay Vazirani, Aug 2001- to present.
- Teaching Assistant at the College of Computing, Georgia Tech, for Freshman Discrete Math, Undergrad Theory: Algorithms and Computability, Grad courses on Algorithms, Graph Algorithms, Approximation Algorithms and Randomized Algorithms.

Services

Reviewer for Journals

Mathematics of Operations Research, SIAM Journal on Computing, SIAM Journal on Discrete Math, Algorithmica, IEEE Journal on Selected Areas in Communications: Non-Cooperative Behavior In Networking, ACM Journal of Experimental Algorithmics.

Miscellaneous

I have been a participant of the **NBHM Mathematics Nurture and Contact Programme** (conducted by Indian Institute of Technology(IIT)-Bombay, University of Mumbai and Tata Institute of Fundamental Sciences(TIFR), Mumbai) during 1998-2001, and have completed the course work, comparable to that in *M.Sc (Mathematics)* in Indian Universities.

Publications (In chronological order)

1. Market Equilibrium via a Primal-Dual-Type Algorithm, with Christos H. Papadimitriou, Amin Saberi and Vijay V. Vazirani. In Proceedings of The IEEE Symposium on Foundations of Computer Science, *FOCS 2002*.
2. Strategyproof cost-sharing Mechanisms for Set Cover and Facility Location Games, with Milena Mihail, and Vijay V. Vazirani. *Decision Support Systems* 39 (2005), pp 11–22. Prelim. version in Proceedings of the ACM conference on Ecommerce, *EC 2003*.
3. Who's the Weakest Link? with Richard J. Lipton, and Nisheeth Vishnoi. In Proc. of 2nd International Symposium on Stochastic Algorithms: Foundations and Applications, *SAGA 2003*.
4. An Improved Approximation Scheme for Computing Arrow-Debreu Prices for the Linear Case, with Vijay V. Vazirani. In Proc. of Foundations of Software Technologies and Theoretical Computer Science, *FSTTCS 2003*.
5. The Spending Constraint Model for Market Equilibrium: Algorithmic, Existence and Uniqueness results, with Vijay V. Vazirani. In Proc. of The ACM Symposium on Theory of Computing, *STOC 2004*.
6. Symmetry Breaking in Trees and Planar Graphs by Vertex Coloring, with V. Arvind. In Proc. of The Nordic Combinatorial Conference, *NORCOM 2004*.
7. On the complexity of Hilbert's 17th problem, with Richard J. Lipton and Nisheeth Vishnoi. In Proc. of The Foundations of Software Technologies and Theoretical Computer Science, *FSTTCS 2004*.
8. Price of Anarchy, Locality Gap, and a Network Service Provider Game, with Naveen Garg, Rohit Khandekar, Vinayaka Pandit, Amin Saberi, and Vijay V. Vazirani. In Proc. of The Workshop on Internet and Network Economics, *WINE 2005*.

9. Integrality Gaps for Sparsest Cut and Minimum Linear Arrangement Problems, with Subhash A. Khot, Rishi Saket and Nisheeth K. Vishnoi. In proc. of The ACM Symposium on Theory of Computing, *STOC 2006*.
10. New results on Rationality and Strongly Polynomial Solvability in Eisenberg-Gale markets, with Deeparnab Chakrabarty, and Vijay Vazirani. In proc. of The Workshop on Internet and Network Economics, *WINE 2006*.
11. On the Equivalence of Competitive and Submodular markets, with Deeparnab Chakrabarty. *Under review*.
12. Random Sampling Auctions for Limited Supply, with Maria-Florina Balcan, Jason D. Hartline and Kunal Talwar. *Under review*.
13. New Geometric Relaxations for the Steiner Tree Problem and their Algorithmic Consequences, with Deeparnab Chakrabarty, and Vijay Vazirani. *Under review*.

References

Available upon request.