

Ravi R. Montenegro

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Employment

8/05-present: University of Massachusetts Lowell, Assistant Professor, Mathematics.
8/02-5/05: Georgia Tech, NSF-VIGRE Visiting Assistant Professor, Mathematics.

Education

Ph.D. in Mathematics (Yale University, December 2002).
Adviser : Ravi Kannan.
Thesis : Isoperimetric inequalities for faster mixing of Markov chains.

B.S. in Mathematics with honors (California Institute of Technology, June 1995).

Research Interests

Mixing times of Markov chains; analysis of randomized algorithms; geometric bounds on eigenvalues; geometric isoperimetric inequalities.

Publications

Book

R. Montenegro and P. Tetali, *Mathematical Aspects of Mixing Times in Markov Chains*, Foundations and Trends in Theoretical Computer Science, now publishers, Boston-Delft, June 2006.

Refereed Publications

1. R. Montenegro, "The simple random walk and max-degree walk on a directed graph," *Random Structures & Algorithms*, to appear, 2008.
2. J.-H. Kim, R. Montenegro, Y. Peres and P. Tetali, "A Birthday Paradox for Markov chains, with an optimal bound for collision in the Pollard Rho Algorithm for Discrete Logarithm," *Proc. of the Algorithmic Number Theory Symposium (ANTS-VIII)*, in Lecture Notes in Computer Science, vol. 5011, pp. 402–415, 2008.
3. R. Montenegro, "Sharp edge, vertex, and mixed Cheeger inequalities for finite Markov kernels," *Electronic Communications in Probability*, volume 12, pp. 377–389, 2007.
4. J.-H. Kim, R. Montenegro, and P. Tetali, "Near Optimal Bounds for Collision in Pollard Rho for Discrete Log," *IEEE Proc. of the Symposium on Foundations of Computer Science (FOCS 2007)*, pp. 215–223, 2007.

5. R. Kannan, L. Lovász, and R. Montenegro, "Blocking conductance and mixing in random walks," *Combinatorics, Probability and Computing*, volume 15:4, pp. 541–570, 2006.
6. R. Montenegro, "A sharp isoperimetric bound for convex bodies," *Israel Journal of Mathematics*, volume 153, pp. 267–284, 2006.
7. S. Goel, R. Montenegro and P. Tetali, "Mixing Time bounds via the Spectral Profile," *Electronic Journal of Probability*, vol. 11, pp. 1–26, 2006.
8. R. Montenegro, "Vertex and edge expansion properties for rapid mixing," *Random Structures & Algorithms*, vol 26:1-2, pp. 52–68, 2005.
9. R. Kannan, M. Mahoney and R. Montenegro, "Rapid Mixing of Several Markov Chains for a Hard-Core Model," *Proceedings of the Symposium on Algorithms and Computation (ISAAC 2003)*, in Lecture Notes in Computer Science, vol. 2906, pp. 663–675, 2003.
10. R. Montenegro and J-B. Son, "Edge Isoperimetry and Rapid Mixing on Matroids and Geometric Markov Chains," *ACM Proceedings of the Symposium on theory of computing (STOC 2001)*, pp. 704–711, 2001.

Awards and Fellowships

- *Faculty-Student Collaborative Research Grant*, University of Massachusetts at Lowell, 2008.
- *Teaching Award* in Mathematics, University of Massachusetts at Lowell, 2007.
- *NSF-VIGRE Fellowship*, Georgia Institute of Technology, 2002-2005.
- *NSF-VIGRE Fellowship*, Yale University, 1999-2002.
- *University Fellowship*, Yale University, 1999-2002.
- *NSF Minority Graduate Fellowship*, 1995-1997, 1998-1999.
- *CalTech Robert A. Millikan Scholarship*, 1992-1994.

Professional Activities

I have refereed 25 research papers or book chapters, regularly attend and speak at conferences or workshops, have mentored Senior research projects with 6 undergraduates, and have extensive teaching experience in Calculus, Discrete Math / Combinatorics, and Probability & Statistics.