CURRICULUM VITAE

MILENA MIHAIL FEBRUARY 2007

College of Computing
Georgia Institute of Technology
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Born Jauary 1, 1961
Greek Citizen, US Permanent Resident

EDUCATION

1989	Ph.D., Computer Science Advisor: U. Vazirani	Harvard University
1985	M.A., Computer Science	Harvard University
1984	Diploma, Electrical Engineering Advisor: C. Papadimitriou	National Technical University of Athens

EXPERIENCE

Jan 1999 - present	Associate Professor	Georgia Institute of Technology College of Computing
1996 - 1998	Director and Senior Scientist	Bell Communications Research
1989 - 1996	Member of Technical Staff	Dept. of Optimization and Computing
1995 - 1997	Visiting Professor	Columbia University
1992 - 1993	Instructor	Dept. of Computer Science
1987 - 1989	Visiting Scholar	University of California, Berkeley

RESEARCH AREAS

Theoretical Computer Science: Randomized Algorithms, Spectral Graph Theory, Markov Chain Monte Carlo Method.
Networking and Large Scale Data: Complex Networks, Scalability, Network Design and Protocols, Network Modeling, Content Distribution, Information Retrieval.

AWARDS

1995	NSF Visiting Professorship for Women Award.
1996	Bellcore Award for Outstanding Contribution.
1999	Edenfield Faculty Award, College of Computing, Georgia Tech.
2000	Order of Omega, Georgia Tech., Faculty of the Year.

PUBLICATIONS

RANDOMIZATION, EXPANDERS and RAPIDLY MIXING MARKOV CHAINS

1. On Coupling and the Approximation of the Permanent, *Information Processing Letters*, 30-1989, pp. 91-95.

2. Polytopes, Permanents, and Graphs with Large Factors, *Proceedings of 29th IEEE Symposium on Foundations of Computer Science* (FOCS 88), pp 412-421, (together with P. Dagum, M. Luby and U. Vazirani).

3. Conductance and Convergence of Markov Chains: A Combinatorial Treatment of Expanders, *Proceedings of 30th IEEE Symposium on Foundations of Computer Science* (FOCS 89), pp 526-531.

4. Balanced Matroids, *Proceedings of 24th Symposium on the Theory of Computing* (STOC 92), pp 26-38, (together with Tomas Feder).

5. On the Expansion of Combinatorial Polytopes, *Invited Paper, Lecture Notes in Computer Science, Springer-Verlag Vol. 629*, 1992, pp 37-49.

6. On the Number of Eulerian Orientations of a Graph, *Proceedings of 3nd ACM/SIAM Annual Symposium on Discrete Algorithms* (SODA 92), pp 138-145, also in *Algorithmica, Special Issue on Randomized Algorithms*, (1996) 16: pp 402-414, (together with Peter Winkler).

7. On the Random Walk Method for Protocol Testing, Proc. of the 6th Conference on Computer-Aided Verification (CAV 94), *Lecture Notes in Computer Science, Springer-Verlag Vol. 818*, 1994, pp 132-141, (together with C. Papadimitriou).

8. Learning the Fourier Spectrum of Probabilistic Lists and Trees, *Proceedings of 2nd ACM/SIAM Annual Symposium on Discrete Algorithms* (SODA 91), pp 291-299, (together with William Aiello).

9. Randomized Algorithms, *Chapter 16.6*, Handbook of of Discrete and Combinatorial Mathematics, Edited by K.H. Rosen, J.G. Michaels and J.L. Gross, *CRC Press*, September 1999.

10. Random Walks and Markov Chains, invited chapter in book "Introduction to Computer Science", edited by Michael Mitzenmacher.

NETWORK DESIGN

10. A Primal-Dual Approximation Algorithm for Generalized Steiner Network Problems, *Proceedings of the 25th Symposium on the Theory of Computing* (STOC 93), pp 708-717, also in *Combinatorica*, 15 (1995), pp 435-454, (together with D. Williamson, M. Goemans, V. Vazirani). Chosen as *paper of impact* by the STOC 93 Program Committee.

11. A Commercial Application of Steiner Network Design: ITP/INPLANS CCS Network Topology Analyzer, *Proceedings of 7th ACM/SIAM Annual Symposium on Discrete Algorithms* (SODA 96), pp 279-287, (together with D. Shallcross, N. Dean and M. Mostrel).

12. Efficient Access to Optical Bandwidth: Wavelength Routing on Directed Fiber Trees, Rings and Trees of Rings, *Proceedings of 36th Annual Symposium on Foundations of Computer Science* (FOCS 95), pp 548-557, (together with C. Kaklamanis and Satish Rao).

13. Optimal wavelength routing on directed fiber trees, *Theoretical Computer Science* 221 (1999), pp 119-137, (together with T. Erlebach, K. Jansen, C. Kaklamanis and P. Persiano).

14. WDM Network Economics Sensitivities, National Fiber Optic Engineers Conference 1997, Vol 1, pp 105-116, (together with R. Cardwell, H. Kobrinski, O. Wasem and K. Bala).

15. Hierarchical Design of WDM Optical Networks for ATM Transport, *Proceedings of IEEE GLOBECOM 1995*, pp 2188-2194, (together with K. Bala and S.V. Jagannath).

16. Monte Carlo and Markov Chain Simulation Techniques for Network Reliability and for Sampling, *Networks, Special Issue on Computing and Network Reliability*, Vol 28 No 3 (1995), pp 117-130, (together with Adam Buchbaum).

17. Computing Spanning Trees in NETPAD, *DIMACS Series in Discrete Mathematics and Theoretical Computer Science* Vol 15 1994, pp 85-98, (together with Keh-Wei Lih and Nate Dean).

18. Covering Problems with Requirements and Costs Evolving Over Time, *Proceedings of the 2nd Annual Workshop on Randomized and Approximation Algorithms* (RAND-APPROX 99), Berkeley, CA 1999.

INTERNET and LARGE SCALE DATA

19. On the Complexity of the View Selection Problem, *Proceedings of the 18th ACM-SIGACT-SIGMOD-SIGART Symposium on Principles of Database Systems* (PODS 99), pp 167-173, (together with Howard Karloff).

20. Caching with Expiration Times, *Proceedings of the 13th ACM/SIAM Annual Symposium on Discrete Algorithms* (SODA 02), (together with P. Gopalan, H. Karloff, A. Mehta, N. Vishnoi). Also, in *Internet Mathematics* Vol 2, No 2, 2005, pp 165-184.

21. On the Eigenvalue Power-Law of the Internet Topology, RANDOM 2002, pp 254-262. (together with Christos Papadimitriou).

22. Spectral Analysis of Internet Topologies, INFOCOM 2003, (together with Christos Gkantsidis and Ellen Zegura).

23. Spectral Analysis for Internet Topologies, to appear in *Transactions of Networking*, (together with Christos Gkantsidis).

24. On Generating Graphs with Prescribed Degree Sequences for Complex Network Modeling Applications. ARACNE 2002, (together with Nisheeth Vishnoi).

25. The Markov Chain Simulation Method for Generating Connected Power Law Random Graphs, ALENEX 2003, (together with Christos Gkantsidis and Ellen Zegura).

26. Strategyproof Cost-Sharing Mechanism for Set Cover and Facility Location Games, ACM Electronic Commerce 2003, also in *Decision Support Systems* Special Issue on ACM-EC 2003, invited paper, Vol 39, Issue 1, March 2005, pp 11-22. (together with Nikhil Devanur and Vijay Vazirani).

27. Throughput and Congestion in Power Law Graphs, Sigmetrics 2003, full paper, (together with Christos Gkantsidis and Amin Saberi).

28. On Certain Connectivity Properties of the Internet Topology FOCS 2003, also to appear in *JCSS Special Issue* on FOCS 2003, invited paper, Vol 72 (2), March 2006, pp 239-251 (together with Christos Papadimitriou and Amin Saberi).

29. On the Random Walk Method in Peer-to-Peer Networks, INFOCOM 2004, *Journal on Performance Evaluation* Special Issue on Peer-to-Peer Networks, invited paper, 63 (2006) pp 241-263 (together with Christos Gkantsidis and Amin Saberi).

30. Hybrid Search Schemes in Unstructured Peer-to-Peer Networks, INFOCOM 2005, (together with Christos Gkantsidis and Amin Saberi).

31. Random Walks in Power Law Random Graphs, to appear in Journal of Internet Mathematics, (together with Amin Saberi and Prasad Tetali).

32. A Local Exchange Markov Chain on Graphs with Given Degrees and Application in the Connectivity of Peer-to-Peer Networks, in FOCS 2006, Berkeley, California, (together with Tomas Feder, Adam Guetz and Amin Saberi).

33. Towards Topology Aware Networks, to appear in INFOCOM Minisymposium 2007, (together with Christos Gkantsidis, Gagan Goel and Amin Saberi).

34. Overlay Architectures for Seamless IP Mobility using Scalable Anycast Proxies, to appear in WCNC 2007, IEEE Wireless Communications and Networking Conference, (together with Christopher Lee, Keshav Attrey, Carlos Caballero, Nick Feamster and John Copeland).

APPLIED PROJECTS and SOFTWARE

MONET (Multiwavelength Optical Networking Technology) Consortium of Bell Labs, Bellcore, Bell Atlantic, BellSouth and Pacific Bell, funded by DARPA for 1995-1999.

Automated SONET Architecture Selector Toolkit Upgrade (Bellcore release May 1997).

Automated CCSN Design Toolkit (Bellcore release August 1994).

PHD STUDENTS

1. Amin Saberi, Ph.D. in Theory in June 04 (joint with V. Vazirani).
   Thesis Title: Algorithmic Aspects of the Internet.
   Current Position: Assistant Professor, Stanford University.

2. Christos Gkantsidis, Ph.D. in Networking in December 05.
   Thesis Title: Internet Topologies: A Spectral Approach.
   Current Position: Microsoft Research, Cambridge, England.

3. Stephen Young, Ph.D. in Mathematics, expected in June 07.
   Thesis Title: A Geometry Driven Model for Complex Networks.

4. K. Subramanian, Ph.D. in Theory and Networking, expected in June 09.

5. Gagan Goel, Ph.D. in Theory, expected in June 09 (joint with V. Vazirani).

6. George Amanatidis, Ph.D. in Mathematics, expected in June 09.

RECENT PROFESSIONAL ACTIVITIES

1. Member, NSF Committee of Visitors, July 1996.

2. Member of Editorial Board, SIAM Journal of Discrete Mathematics, 1996-1999.
3. Member, DIMACS Council, 1995-1998.
4. Member, DIMACS Council, 1995-1998.
5. Member of Program Committee, FOCS 1992.
6. Member of Program Committee, STOC 1998.
7. Member of Program Committe, SODA 2003.
8. Member of Program Committee, RANDOM 2005.
9. Organizer, SIAM Minisymposium on Sparse Random Graphs, Victoria, BC, June 2006.
10. Co-organizer, DIMACS-Georgia Tech Workshop on Complex Networks and their Applications, Atlanta, January 22-24, 2007.
11. Member of Program Committee, STOC 2007.
12. Member of Program Committee, Electronic Commerce 2007.

SELECTED RECENT INVITED PRESENTATIONS

- Dimacs Workshop on Internet Modeling, February 2002.
  Title: "Spectral Analysis of Internet Topologies".
- UCLA-IPAM workshop on Internet Modeling, March 2002 and September 2003.
  Title: "On the Eigenvalue Powerlaw".
- U.C. Berkeley, Theory Luch, April 2002.
  Title: "On the Eigenvalue Powerlaw".
- U.C. Santa Barbara, September 2002.
  Title:"Spectral Methods for Internet Topologies".
- IBM, Almaden, October 2002.
  Title:"On the Impact of Clustering in Internet Topologies ".
- University og Illinois, Urbana Champaign, December 2002.
  Title:"Spectral Methods for Internet Topologies ".
- AMS Annual Meeting, January 2003.
  Title:"Powerlaw Random Graphs".
- IMA Minnesota, March 2003.
  Title:"Conductance and Congestion in Powerlaw Graphs".

- Schloss Dagstuhl Workshop on Algorithms, Games and the Internet, July 2003.
  Title:"Performance in Powerlaw Graphs".
- CMU Aladdin Workshop on Modeling Massive Graphs, March 2004.
  Title:"Expansion and Conductance in Powerlaw Random Graphs".
- SIAM Annual Meeting, Nashville, TN, June 2004.
  Title:"Hybrid Search Schemes in Powerlaw Graphs".
- MSRI-Berkeley Workshop on Internet Models, March 2005.
  Title:"Algorithmic Performance in Powerlaw Random Graphs".
- RPI Distinguished Lecture Series, May 2005.
  Title:"Protocol Performance in Powerlaw Random Graphs".
- Stanford University, Probability Seminar, October 2005.
  Title:"Algorithmic Performance in Powerlaw Random Graphs".
- Erdos Memorial Lectures, Invited Speaker, Nashville, March 2006.
  Title:"Erdos and the Internet".
- NSF Workshop on Theory of Networked Computation, Berkeley, March 2006.
  Title:"Complex Networks: Connectivity and Functionality".
- MIT Theory Seminar, May 2006.
  Title: "Algorithmic Performance in Complex Networks".
- Duke University, CS Seminar, October 2006.
  Title: "Algorithmic Performance in Complex Networks".
- Microsoft Research, Theory Seminar, November 2006.
  Title: "Towards Topology Aware Networks".
- DIMACS/Georgia Tech Kickoff Day of Special Year on Discrete Random Systems.
  Title: "Algorithmic Performance in Complex Networks".
- CMU, Theory Seminar, November 2006.
  Title: "Towards Topology Aware Networks".
- IPAM (Institute for Pure and Applied Mathematics), UCLA, May 2007.
  Workshop on Random and Dynamic Graphs and Networks, invited speaker.