Dr. Michael H Dinitz

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Research Interests

Approximation algorithms, theoretical networking, metric embeddings. Applications to networking and distributed computing.

Education

Carnegie Mellon University, Pittsburgh, PA
Ph.D. in Computer Science
Graduation Date: August 2010
Thesis: *Algorithms and Models for Problems in Networking*
Advisor: Anupam Gupta
Thesis Committee: Anupam Gupta, Bruce Maggs, Avrim Blum, Matthew Andrews

Princeton University, Princeton, NJ
A.B. *summa cum laude* in Computer Science, certificate in Applied and Computational Mathematics
Graduation Date: June 2005
Awards and Honors: Shapiro Prize for Academic Excellence, 2003
Thesis: *Approximation Algorithms for* Sparsest Cut. Advisor: Sanjeev Arora

Champlain Valley Union High School, Hinesburg, VT
Graduation Date: June 2001

Work Experience

Postdoctoral Fellow, Weizmann Institute of Science (Summer 2010 - present)
Postdoc in the Computer Science and Applied Mathematics Department at Weizmann, hosted by Robert Krauthgamer and David Peleg. Research in approximation algorithms.

Research Intern, Alcatel-Lucent Bell Labs (Summer 2009)
Worked with Gordon Wilfong on problems related to the border gateway protocol and interdomain routing, especially on algorithms for disseminating external route information within an autonomous system.

Research Intern, Alcatel-Lucent Bell Labs (Summer 2008)
Worked with Matthew Andrews on the problem of maximizing wireless network capacity in the physical model. Proved hardness results, algorithmic guarantees, and game-theoretic guarantees.

Research Intern, Microsoft Research-Silicon Valley (Summer 2007)
Worked at MSR-SVC under Dahlia Malkhi and Kunal Talwar. Studied dynamic embeddings and embeddings with relaxed guarantees in the context of the Sequoia network latency prediction project.

Publications

Michael Dinitz, Guy Kortsarz, and Ran Raz. *Label Cover Instances with Large Girth and the Hardness of Approximating Basic k-Spanner.* In Proceedings of the 39th International Colloquium on Automata, Languages and Programming (ICALP 2012).

Atish Das Sarma, **Michael Dinitz**, and Gopal Pandurangan. *Efficient Computation of Distance Sketches in Distributed Networks.* In Proceedings of the 24th ACM Symposium on Parallelism in Algorithms and Architectures (SPAA 2012).

Michael Dinitz and Robert Krauthgamer. *Fault-Tolerant Spanners: Better and Simpler*. In Proceedings of the 30th Annual ACM Symposium on Principles of Distributed Computing (PODC 2011).

Michael Dinitz and Robert Krauthgamer. *Directed Spanners via Flow-Based Linear Programs*. In Proceedings of the 43rd Annual ACM Symposium on Theory of Computing (STOC 2011).

Michael Dinitz. *Distributed Algorithms for Approximating Wireless Network Capacity*. In Proceedings of the 29th IEEE Conference on Computer Communications (INFOCOM 2010)

Michael Dinitz, Jonah Gold, Thomas Sharkey, and Lorenzo Traldi. *Graphical Representations of Clutters*. Ars Combinatoria. 94 (2010), pp 303-320.

Matthew Andrews and **Michael Dinitz**. *Maximizing Capacity in Arbitrary Wireless Networks in the SINR Model: Complexity and Game Theory*. In Proceedings of the 28th IEEE Conference on Computer Communications (INFOCOM 2009).

Moshe Babaioff, **Michael Dinitz**, Anupam Gupta, Nicole Immorlica, and Kunal Talwar. *Secretary Problems: Weights and Discounts*. In Proceedings of the Twentieth Annual ACM-SIAM Symposium on Discrete Algorithms (SODA 2009).

Michael Dinitz. *Online, Dynamic, and Distributed Embeddings of Approximate Ultrametrics*. In Proceedings of the 22nd International Symposium on Distributed Computing (DISC 2008).

Michael Dinitz. *Compact Routing with Slack*. In Proceedings of the Twenty-Sixth Annual ACM Symposium on Principles of Distributed Computing (PODC 2007).

T.H.-Hubert Chan, **Michael Dinitz**, and Anupam Gupta. *Spanners With Slack*. In Proceedings of the 14th Annual European Symposium on Algorithms (ESA 2006).

Michael Dinitz. *Full Rank Tilings of Finite Abelian Groups*. SIAM J. Discret. Math. 20, 1 (Jan. 2006), 160-170.

Michael Dinitz and Jeffrey Dinitz. *Enumeration of Balanced Tournament Designs on 10 Points*. Journal of Combinatorial Mathematics and Combinatorial Computing, **52** (2005), 51-63

Submitted Papers

Eden Chlamtac, **Michael Dinitz**, and Robert Krauthgamer. *Everywhere-Sparse Spanners via Dense Subgraphs*. Submitted.

Michael Dinitz and Gordon Wilfong. *Constrained Connectivity and iBGP*. Submitted.

Work in Preparation

Michael Dinitz and Guy Kortsarz. *The Matroid Secretary Problem on Regular Matroids*.

Michael Dinitz, Howard Karloff, Li Erran Li, and Gordon Wilfong. *Tight Bounds on Retransmission Permutations in OFDM Wireless Networks*.

Michael Dinitz and Anupam Gupta. *Approximation Algorithms for Sparse Packing Interdiction and Partial Covering Problems*.

Andrew Beveridge, **Michael Dinitz**, and Anupam Gupta. *Embedding Commute Time Metrics into ℓ_1 with Low Distortion*.

Grants and Fellowships

National Science Foundation Graduate Research Fellowship (September 2005 - September 2008)

ARCS (Achievement Rewards for College Scientists) Scholarship: $15000

Teaching

Teaching Assistant for 15-750 Graduate Algorithms, taught by Gary Miller. Spring 2009

Teaching Assistant for 15-451 Algorithms, taught by Avrim Blum. Fall 2007

Lab TA for COS 126 (General Computer Science), COS 217 (Introduction to Programming Systems), and COS 226 (Algorithms and Data Structures). Fall 2003 - Spring 2005

Service

Conference reviewer for: STOC, FOCS, SODA, PODC, SPAA, ESA, ICALP, ITCS, APPROX, INFOCOM, IPDPS, COCOON

Journal referee for: SIAM Journal on Computing, SIAM Journal on Discrete Mathematics, Transactions on Algorithms, Discrete and Computational Geometry, Computational Geometry: Theory and Applications, Transactions on Networking, Transactions on Mobile Computing, Theoretical Computer Science, Distributed Computing, Transactions on Vehicular Technologies, Transactions on Wireless Computing, Transactions on Parallel and Distributed Systems, International Journal of Algebra and Computation

Member of search committee for Department Head, CMU Computer Science Department. Fall 2009 - Winter 2010.

Member of Dec/5, the School of Computer Science graduate student social committee. Fall 2005 - Spring 2010

Member of FreeCSD, the Computer Science Department graduate student social committee. Fall 2005 - Spring 2010

Organized the CMU Computer Science Theory Lunch. Spring 2006 - Fall 2006

Member of the Computer Science Undergraduate Council. Fall 2004 - Spring 2005

Invited Talks

April 4, 2012: "Approximation Algorithms for Graph Spanners". University of Haifa Computer Science Colloquium. Haifa, Israel.

March 26, 2012: "Network Design Problems via Convex Relaxations". Google Research. New York, NY.

March 21, 2012: "Network Design Problems via Convex Relaxations". University of Connecticut. Storrs, CT.

January 13, 2012: "Network Design Problems via Convex Relaxations". Alcatel-Lucent Bell Labs. Murray Hill, NJ.

November 16, 2011: "The secretary problem revisited: online auctions and matroids". Weizmann Theory Lunch. Rehovot, Israel.

September 13, 2011: " Fault-Tolerant Spanners: Better and Simpler". Warwick-Weizmann 2011 Workshop. Coventry, England.

June 1, 2011: "Directed Spanners via Flow-Based Linear Programs." Technion Theory Seminar. Haifa, Israel.

April 6, 2011: "Directed Spanners via Flow-Based Linear Programs." Hebrew University CS Theory Seminar. Jerusalem, Israel.

April 5, 2011: "Directed and Fault-Tolerant Spanners." Ben Gurion University Computer Science Colloquium. Beersheva, Israel.

March 14, 2011: "Directed Spanners via Flow-Based Linear Programs." Tel Aviv University Algorithms Seminar. Tel Aviv, Israel.

December 22, 2010: "Set-Constrained Connectivity Problems." Weizmann Theory Lunch. Rehovot, Israel.

December 8, 2010: "Directed Spaners via Flow-Based Linear Programs." Weizmann-Warwick Meeting 2010. Weizmann Institute of Science. Rehovot, Israel.

February 2, 2010: "Approximating Wireless Network Capacity". Los Alamos National Lab. Los Alamos, New Mexico.

January 20, 2010: "Approximating Wireless Capacity in the Physical Model". University of Vermont. Burlington, Vermont.

January 13, 2010: "Wireless Network Capacity in the Physical Model". West Virginia University. Morgantown, West Virginia.

September 30, 2009: "iBGP and Constrained Connectivity". CMU Theory Lunch. Pittsburgh, Pennsylvania.

August 24, 2009: "Wireless Network Capacity in the Physical Model". International Symposium on Mathematical Programming (ISMP) 2009. Chicago, Illinois.

March 27, 2009: "Approximating Wireless Capacity in the Physical Model". University of Michigan. Ann Arbor, Michigan

October 29, 2008: "Maximizing Capacity in Arbitrary Wireless Networks in the SINR Model: Complexity and Game Theory". CMU Theory Lunch. Pittsburgh, Pennsylvania.

June 14, 2008: "Secretary Problems: Weights and Discounts". Alcatel-Lucent Bell Labs. Murray Hill, NJ.

April 16, 2008: "The Discounted Secretary Problem". CMU Theory Lunch. Pittsburgh, Pennsylvania.

October 17, 2007: "Compact Routing with Slack". CMU Theory Lunch. Pittsburgh, Pennsylvania.

October 6, 2006: "Spanners with Slack". Workshop on Flexible Network Design. Bertinoro, Italy.

September 27, 2006: "Spanners with Slack". CMU Theory Lunch. Pittsburgh, Pennsylvania.

September 1, 2004: "Full Rank Tilings of Finite Abelian Groups". University of Vermont. Burlington, Vermont.

CITIZENSHIP United States of America

LANGUAGES English

REFERENCES

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