Samantha Riesenfeld

CONTACT INFORMATION

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CURRENT RESEARCH INTERESTS

My main interests are in combinatorial optimization, algorithms, and algorithmic tools for analyzing large, complex data sets, such as those arising in computational biology. I am also interested in machine learning, applied probability, and networks.

EDUCATION

University of California, Berkeley
Ph.D. in Computer Science, 2007.

Dissertation: Optimization and Reconstruction over Graphs.

Advisor: Prof. Richard M. Karp

Committee: Profs. Richard M. Karp (Chair), Satish Rao, Alistair Sinclair, and Dorit Hochbaum.

Summary: The thesis studies the problem of efficiently finding a graph that satisfies, to the extent possible, a given set of constraints. We give approximation algorithms for finding a minimum-cost bounded-degree spanning tree in a given graph, as well as algorithms and lower bounds for sorting a partially ordered set, given an oracle for the partial order relation.

Relevant Courses: Approximation Algorithms, Probability on Trees and Networks, Randomness and Computation, Computational Complexity, Mathematics of Phylogenetic Trees, Polynomials of Random Variables, Cryptography, Information Theory, Data Transport Protocols, Random Graphs, Knowledge Representation and Reasoning. GPA: 3.88/4.0.

Harvard University
B.A. in Mathematics, Computer Science, 2000. Cum laude, general and departmental honors.

Senior thesis: Analysis of randomized algorithm for computing group representations over finite fields. Advised by Prof. Michael Rabin.

Relevant Courses: Efficient Algorithms, Graph Theory and Combinatorics, Real and Complex Analysis, Abstract Algebra, Probability, Topology, Logic, Programming in C and C++, Computer Networks, Computer Graphics. GPA: 3.75/4.0.

PUBLICATIONS

- **Sorting and selection in posets.** With Constantinos Daskalakis, Richard M. Karp, Elchanan Mossel, and Elad Verbin. Submitted, 2007. Available at http://arxiv.org/abs/0707.1532.
- **A push-relabel algorithm for approximating the minimum-degree MST problem and its generalization to matroids.** With Kamalika Chaudhuri, Satish Rao, and Kunal Talwar. *Theoretical Computer Science (Special Issue for ICALP 2006)*. Invited submission, to appear.
- **A push-relabel algorithm for approximating degree bounded MSTs.** With Kamalika Chaudhuri, Satish Rao, and Kunal Talwar. *Proc. of ICALP,* 2006.
- **What would Edmonds do? Augmenting paths and witnesses for degree-bounded MSTs.** With Kamalika Chaudhuri, Satish Rao, and Kunal Talwar. *Proc. of APPROX,* 2005. Journal version in *Algorithmica (Special Issue for APPROX/RANDOM 2005)*. Invited submission, to appear.
- **Power-aware base station positioning for sensor networks**. With Andrej Bogdanov and Elitza Maneva. *Proceedings of INFOCOM, 2004*.

INVITED TALKS & MANUSCRIPTS

- **Sorting and ranking in partially ordered sets**. Invited talk, *Bay Area Theory Symposium (BATS)*, IBM Almaden Research Center, CA, 2006.
- **Inferring reticulate evolution networks from consensus gene trees.** With Richard M. Karp. Preprint, 2004. Invited talk, *Cyberinfrastructure for Phylogenetic Research (CIPRES)* Annual All-Hands meeting, San Diego, CA, Jan. 2005.
- **WEBRC receiver coordination**. With Kamalika Chaudhuri, Michael Luby, and Elitza Maneva. Manuscript, 2003.
- **A probabilistic look at the Schur and van der Waerden numbers**. With Anant Godbole and Abby Jager. Presented at MAA/AMS conference in 1998.

RESEARCH EXPERIENCE

Graduate Student Researcher, *U.C. Berkeley,* Berkeley, CA 2002–2007
Advised by Prof. Richard M. Karp. Conducted research on algorithmic, combinatorial problems in theoretical computer science and computational biology.

Research Intern, *I.N.R.I.A.,* Sophia-Antipolis, France Feb 1998–Aug 1998
Advised by Dr. Olivier Faugeras, Director of Project Robotvis. Developed, designed, and C-programmed a pilot project related to image-based rendering for a computer vision research lab.

Research Intern, *Michigan Technical University*, Houghton, MI Summer 1997
Advised by Prof. Anant Godbole. Conducted research in probability theory in a Research Experiences for Undergraduates program, funded by the National Science Foundation.

TEACHING EXPERIENCE

Graduate Student Instructor, *U.C. Berkeley,* Berkeley, CA Spring semester, 2004
Taught two weekly sections of 20–30 students, graded exams. Course:
Efficient Algorithms and Intractable Problems, Profs. Christos Papadimitriou, Umesh Vazirani.

Teaching Fellow, *Harvard University,* Cambridge, MA Fall semesters, 1997–1999
Taught weekly section of 10–15 students, graded homework and exams. Courses:
Efficient Algorithms (graduate level), Prof. Michael Rabin;
Honors Linear Algebra and Real Analysis I, Prof. Michael Nakamaye;
Introduction to Formal Systems and Computation, Prof. Harry Lewis.

LANGUAGES

- Fluent in C, C++. Familiar with Java, HTML, Lisp, Mathematica, MATLAB.
- Fluent in spoken French; fair written French. Basic Spanish.

HONORS AND AWARDS

- National Science Foundation Graduate Fellowship for three years, in 2001–2005.
- John Harvard and Harvard College Scholarships for academic achievement, 1996–2000.
- National Merit Scholar, 1995.

REFERENCES

- Prof. Richard M. Karp, U.C. Berkeley <karp@cs.berkeley.edu>
- Prof. Satish Rao, U.C. Berkeley <satishr@cs.berkeley.edu>
- Prof. Alistair Sinclair, U.C. Berkeley <sinclair@cs.berkeley.edu>