Daniel R. Golovin

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RESEARCH INTERESTS

Online & approximation algorithms, particularly for machine learning and optimization; Resource allocation problems; Provably sound ways of dealing with uncertainty; Algorithmic game theory; Strongly history-independent/uniquely-represented data structures.

EDUCATION

2008	*Ph.D. in Computer Science* Carnegie Mellon University, Pittsburgh, PA School of Computer Science Advised by Guy Blelloch, Professor, Dept. of Computer Science
2006	*Masters of Science in Computer Science* Carnegie Mellon University, Pittsburgh, PA School of Computer Science Advised by Guy Blelloch, Professor, Dept. of Computer Science
2003	*Bachelor of Science, Magna Cum Laude, in Computer Science, with a minor in applied mathematics.* Cornell University, Ithaca, NY College of Engineering

HONORS

2003–2008	Graduate Fellowship at Carnegie Mellon University
2007	IEEE FOCS Student Travel Grant
2007	ACM EC Student Travel Scholarship Award
2003 & 2004	Honorable Mention, NSF Graduate Fellowship
2003	Finalist, John and Fannie Hertz Foundation Graduate Fellowship
2003	Graduated Cornell University College of Engineering, *Magna Cum Laude*
2002	Selected for the team of three students representing Cornell University in the William Lowell Putnam mathematical competition.
1998	New Jersey Governor's School in the Sciences Scholar

PUBLICATIONS

Thesis

[1] Daniel Golovin. *Uniquely Represented Data Structures with Applications to Privacy*. PhD thesis, Carnegie Mellon University, Pittsburgh, PA, August 2008. CMU-CS-08-135.

Refereed Journal and Conference Papers

[1] Matthew Streeter, Daniel Golovin, and Andreas Krause. Online learning of assignments. In Y. Bengio, D. Schuurmans, J. Lafferty, C. K. I. Williams, and A. Culotta, editors, *Advances in Neural Information Processing Systems 22*, pages 1794–1802. 2009.

[2] Daniel Golovin. B-treaps: A uniquely represented alternative to B-trees. In *ICALP '09: Proceedings of the 36th International Colloquium on Automata, Languages and Programming*, pages 487–499, Berlin, Heidelberg, 2009. Springer-Verlag.

[3] Konstantin Andreev, Charles Garrod, Daniel Golovin, Bruce M. Maggs, and Adam Meyerson. Simultaneous source location. *ACM Transactions on Algorithms*, 6(1):1–17, 2009.

[4] Matthew Streeter and Daniel Golovin. An online algorithm for maximizing submodular functions. In D. Koller, D. Schuurmans, Y. Bengio, and L. Bottou, editors, *Advances in Neural Information Processing Systems 21*, pages 1577–1584. 2008. An earlier version appeared as Carnegie Mellon University technical report CMU-CS-07-171.

[5] Daniel Golovin, Anupam Gupta, Amit Kumar, and Kanat Tangwongsan. All-Norms and All-L_p-Norms approximation algorithms. In *FSTTCS '08: Proceedings of the 28th annual Conference on Foundations of Software Technology and Theoretical Computer Science*, pages 199–210, Bangalore, India, 2008. An earlier version appeared as Carnegie Mellon University technical report CMU-CS-07-153.

[6] Guy E. Blelloch, Daniel Golovin, and Virginia Vassilevska. Uniquely represented data structures for computational geometry. In *SWAT '08: Proceedings of the 11th Scandinavian Workshop on Algorithm Theory*, pages 17–28, Gothenburg, Sweden, July 2008. Springer.

[7] Guy E. Blelloch and Daniel Golovin. Strongly history-independent hashing with applications. In *FOCS '07: 48th Annual IEEE Symposium on Foundations of Computer Science*, pages 272–282. IEEE, October 2007.

[8] Matthew Streeter, Daniel Golovin, and Stephen F. Smith. Combining multiple heuristics online. In *AAAI '07: Proceedings of the Twenty-Second AAAI Conference on Artificial Intelligence*, pages 1197–1203, Menlo Park, California, 2007. AAAI Press.

[9] Matthew Streeter, Daniel Golovin, and Stephen F. Smith. Restart schedules for ensembles of problem instances. In *AAAI '07: Proceedings of the Twenty-Second AAAI Conference on Artificial Intelligence*, pages 1204–1210, Menlo Park, California, 2007. AAAI Press.

[10] Daniel Golovin. Stochastic packing-market planning. In *EC '07: Proceedings of the 8th ACM conference on Electronic commerce*, pages 172–181, New York, NY, USA, 2007. ACM Press.

[11] Daniel Golovin, Viswanath Nagarajan, and Mohit Singh. Approximating the k-multicut problem. In *SODA '06: Proceedings of the seventeenth annual ACM-SIAM Symposium on Discrete algorithms*, pages 621–630, New York, NY, USA, 2006. ACM Press.

[12] Daniel Golovin, Anupam Gupta, Bruce M. Maggs, Florian Oprea, and Michael K. Reiter. Quorum placement in networks: Minimizing network congestion. In *PODC '06: Proceedings of the twenty-fifth annual ACM symposium on Principles of distributed computing*, pages 16–25, New York, NY, USA, 2006. ACM Press.

[13] Daniel Golovin, Vineet Goyal, and R. Ravi. Pay today for a rainy day: Improved approximation algorithms for demand-robust min-cut and shortest path problems. In B. Durand and

W. Thomas, editors, *Proceedings of the 23rd Symposium on Theoretical Aspects of Computer Science, STACS 2006*, volume 3884 of *Lecture Notes in Computer Science*, pages 206–217. Springer-Verlag, 2006.

[14] Daniel Golovin. A model for optimal path planning for self-reconfigurable robots. In *Proceedings of the 11th International Conference on Advanced Robotics, ICAR 2003*, 2003.

Technical Reports which do not overlap with above lists

[1] Daniel Golovin. Max-min fair allocation of indivisible goods. Technical Report CMU-CS-05-144, School of Computer Science, Carnegie Mellon University, June 2005.

Other Publications

[1] Daniel Golovin. More expressive market models and the future of combinatorial auctions. *SIGecom Exch.*, 7(1), 2007.

[2] Matthew Streeter, Daniel Golovin, and Stephen F. Smith. Combining multiple constraint solvers: Results on the CPAI'06 competition data. In *Proceedings of the Second International CSP Solver Competition*, pages 11–18, 2008.

POSITIONS HELD

Sept. 2009–Present	Postdoctoral Research Fellow, Center for the Mathematics of Information, California Institute of Technology
2008–2009	Postdoctoral Research Fellow, Center for Computational Thinking, Carnegie Mellon University
Summer 2006	Research Intern, Amazon.com I helped redesign Amazon's core order-fulfillment algorithm, which decides how best to get merchandise from Amazon's distributed inventory system to the customers.
Summer 2001	Research Intern, Xerox Palo Alto Research Center (PARC) I worked on a variety of problems in the modular robotics lab, devised novel schemes for internal representation and planning, and built applications for robot control.

TEACHING

Winter 2010	Instructor (with Andreas Krause) for *Advanced Topics in Machine Learning*.
Fall 2008	Instructor (with Guy Blelloch) for graduate level *Algorithms in the Real World*.
Spring 2007	Teaching Assistant for *Graduate Algorithms*.
Spring 2006	Teaching Assistant for undergraduate level *Algorithm Design and Analysis*.

PROFESSIONAL SERVICE

Reviewer for Journals and Conferences:

Algorithmica, APPROX, COLT, ESA, FOCS, Info. Proc. Let., JMLR, STOC, WINE.

RESEARCH TALKS

Dec. 2009	*Online Maximization of Submodular Functions* NIPS Workshop on Discrete Optimization in Machine Learning
March 2009	*Online Maximization of Submodular Functions* Yahoo! Research
March 2009	*Online Maximization of Submodular Functions* Ohio State University
Nov. 2008	*Uniquely Represented Data Structures with Applications to Privacy* Stanford University
Nov. 2008	*Uniquely Represented Data Structures with Applications to Privacy* Microsoft Research, Silicon Valley Center
April 2008	*Uniquely Represented Data Structures with Applications to Privacy* Northeastern University
March 2008	*Uniquely Represented Data Structures with Applications to Privacy* University of Rochester
March 2008	*Uniquely Represented Data Structures with Applications to Privacy* University of Massachusetts Amherst
Oct. 2007	*Strongly History Independent Hashing with Applications* IEEE Symposium on Foundations of Computer Science (FOCS)
June 2007	*Stochastic Packing-Market Planning* ACM Conference on Electronic Commerce (EC)
June 2006	*Robust Minimum Cut and Shortest Path Problems* Amazon.com Algorithms Seminar
May 2005	*Prize Collecting Cuts* Lamps of ALADDIN Student Workshop at Carnegie Mellon University

PERSONAL DETAILS

Citizenship: United States of America

REFERENCES

Available upon request.