

ABRAHAM D. FLAXMAN

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- Education** CARNEGIE MELLON UNIVERSITY Pittsburgh, PA
Graduation May, 2006.
Ph.D. in Mathematics specializing in Algorithms, Combinatorics, and Optimization. Thesis title: "Average-case analysis for combinatorial problems".
Advisor: Alan Frieze
- MASSACHUSETTS INSTITUTE OF TECHNOLOGY Cambridge, MA
Graduation June, 2000.
B.S. in Mathematics. GPA 4.9/5.0.
- Research Experience** UNIVERSITY OF WASHINGTON, INSTITUTE FOR HEALTH METRICS AND EVALUATION Seattle, WA
Sept 2008 to present
Research in descriptive epidemiology and health intervention coverage.
Advisors: Christopher Murray and Stephen Lim
- MICROSOFT RESEARCH, THEORY GROUP Redmond, WA
June 2006 to June 2008
Research in random graph theory and complex networks.
Advisors: Christian Borgs and Jennifer Chayes
- MICROSOFT RESEARCH, SILICON VALLEY CAMPUS Mountainview, CA
Summer, 2005
Research in the theory of auctions and mechanism design.
Advisor: Jason Hartline
- TOYOTA TECHNICAL INSTITUTE Chicago, IL
Early Summer, 2004
Research in theory of machine learning, on-line algorithms, and Markov Chain Monte Carlo.
Advisors: Adam Kalai and Eric Vigoda
- IBM, T. J. WATSON RESEARCH CENTER White Plains, NY
Summer, 2003; Late Summer, 2004; November 2005
Research in extremal combinatorics and average case analysis of on-line and

approximation algorithms.

Advisor: Gregory Sorkin

E-INK CORPORATION
Summer, 2000

Cambridge, MA

Design of high resolution display drivers for a novel addressable display technology.

Advisor: Peter Kazlas

LOS ALAMOS NATIONAL LABORATORY,
T-DOT GROUP
Summers, 1997 – 2000

Los Alamos, NM

Research on Basis Pursuit, Independent Component Analysis, and spectral estimation. *Advisor:* George Zweig

**Teaching
and
Advising
Experience**

UNIVERSITY OF WASHINGTON
2007

Seattle, WA

- Algorithms and Economics of Networks (CS grad topics course), Spring 2007
Co-lecturer with Vahab Mirrokni.
- Masters Thesis Co-Advisor for Elisa Celis, Spring 2007
Title *Bias in the Indegree Distribution in a Snowball Sample of a Large Random Network*, defended June 2007

CARNEGIE MELLON UNIVERSITY
Fall, 2001 – Fall, 2007

Pittsburgh, PA

- Opportunities for Undergraduate Research in Computer Science (OurCS), Oct. 5-7, 2007
Co-leader of an intensive research experience for female computer science majors (9 students).
- Matrix Algebra, Fall, 2003
Lecturer for one section of 30 students.
- Operations Research I, Spring, 2002
Teaching assistant for two sections of 10 students each.
- Calculus in 3 Dimensions, Fall, 2001
Teaching assistant for two sections of 30 students each.

HAMPSHIRE COLLEGE SUMMER
STUDIES IN MATHEMATICS
Summer, 2001

Amherst, MA

Junior staff.

- Honors and Awards** NSF Post-doctoral Fellowship 2006 (declined); IBM Graduate Student Fellowship, 2005-2006; NSF VIGRE Fellowship, 2000-2003.
- Research Currently Under Review and in Preparation**
- A. D. Flaxman, S. S. Lim, T. Vos, and C. J. L. Murray. From systematic review to global estimates of disease burden: a Bayesian hierarchical compartmental model. Manuscript in preparation.
- J. Marcus, J. K. Rajaratnam, C. J. L. Murray, and A. D. Flaxman. A comparison of methods for synthesizing data on under-5 mortality in a population micro-simulation environment. Manuscript in preparation.
- O. Angel, A. D. Flaxman, and D. B. Wilson. A sharp threshold for minimum bounded-depth and bounded-diameter spanning trees and Steiner trees in random networks. Manuscript under review by *Combinatorica*.
- Peer-reviewed Research**
- U. Feige, A. D. Flaxman, and D. Vilenchik. On the diameter of the set of satisfying assignments in random satisfiable k-CNF formulas. To appear in *SIAM Journal on Discrete Math*.
- A. D. Flaxman, N. Fullman, M. W. Otten Jr, M. Menon, R. E. Cibulskis, M. Ng, C. J. L. Murray, and S. S. Lim. Rapid scaling-up of insecticide-treated bed net coverage in Africa and its relationship with development assistance for health: A systematic synthesis of supply, distribution and household survey data. *PLoS Med* 7(8) (2010): e1000328.
- J. Rajaratnam, J. Marcus, A. D. Flaxman, H. Wang, A. Levin-Rector, L. Dwyer, M. Costa, A. Lopez, C. J. L. Murray. Neonatal, postneonatal, childhood, and under-5 mortality for 187 countries, 1970-2010: a systematic analysis of progress towards Millennium Development Goal 4, *The Lancet*, Volume 375, Issue 9730 (2010), 1988-2008.
- S. T. Green and A. D. Flaxman. Machine learning methods for verbal autopsy in developing countries. *AAAI Spring Symposium on Artificial Intelligence for Development (AI-D)* (2010).
- P. G. Constantine, A. D. Flaxman, D. F. Gleich, and A. Gunawardana. Tracking the random surfer: Empirically measured teleportation parameters in PageRank. *Proc. of the 19th international conference on World wide web (WWW)*, (2010) 381-390.
- M. Bailly-Bechet, S. Bradde, A. Braunstein, A. D. Flaxman, L. Foini, and R. Zecchina. Clustering with shallow trees. *Journal of Statistical Mechanics* (2009) P12010.
- A. D. Flaxman, D. Gamarnik, and G. B. Sorkin. First-passage percolation and VCG-overpayment on a width-2 strip. Tentatively accepted to appear in *Random Structures and Algorithms*; (extended abstract appeared in *Proc. of*

the 2nd International Workshop on Internet and Network Economics (2006) 99-111).

A. D. Flaxman. A spectral technique for random satisfiable 3CNF formulas, *Random Structures and Algorithms*, 32 (4) (2008) 519-534; (extended abstract appeared in *Proc. 14th Annual ACM-SIAM Symposium on Discrete Algorithms (SODA)* (2003) 357-363).

H. Yu, M. Kaminsky, P. B. Gibbons, and A. D. Flaxman. Defending against Sybil attacks via social networks. *IEEE/ACM Transactions on Networking* 16 (3) (2008) 576-589; (extended abstract appeared in *Proc. of the 2006 conference on applications, technologies, architectures, and protocols for computer communications (SIGCOMM)*, (2006) 267-278).

R. Andersen, C. Borgs, J. Chayes, U. Feige, A. D. Flaxman, A. Kalai, V. Mirrokni, and M. Tennenholtz. Trust-based recommendation systems: an axiomatic approach. *Proc. of the 17th international conference on World Wide Web (WWW)* (2008) 199-208.

M. Carey, A. D. Flaxman, J. Hartline, and A. Karlin. Auctions for structured procurement. *Proc. of the 19th Symposium on Discrete Algorithms (SODA)* (2008) 204-313.

A. D. Flaxman. Algorithms for random 3-SAT. *The Encyclopedia of Algorithms* (2008) 742-744.

A. D. Flaxman, A. M. Frieze, and J. Vera. A geometric preferential attachment model of networks II. *Internet Mathematics* 4 (1) (2007) 87-111; (extended abstract appeared in *Proc. of the 5th International Workshop on Algorithms and Models for the Web-Graph (WAW)* (2007) 41-55).

A. D. Flaxman and J. Vera. Bias reduction in traceroute sampling: towards a more accurate map of the Internet. *Proc. of the 5th International Workshop on Algorithms and Models for the Web-Graph (WAW)* (2007) 1-15.

A. D. Flaxman, A. M. Frieze, and J. C. Vera. Adversarial deletions in a scale-free random graph process. *Combinatorics, Probability, and Computing* 16 (2007) 261-270; (extended abstract appeared in *Proc. of the 16th Symposium on Discrete Algorithms (SODA)* (2005) 287-292).

A. D. Flaxman. A lower bound on the large deviation probability for the lower tail of the random minimum spanning tree. *Electronic Journal of Combinatorics* 14 (1) (2007) N3.

A. D. Flaxman and S. Hoory. Maximum matchings in regular graphs of high girth. *Electronic Journal of Combinatorics* 14 (1) (2007) N1.

A. D. Flaxman. Expansion and lack thereof in perturbed random graphs. *Internet Mathematics* 4 (2-3) (2007) 131-147; (extended abstract appeared

in *Proc. of 4th International Workshop on Algorithms and Models for the Web-Graph (WAW)* (2006) 24-35).

A. D. Flaxman, A. M. Frieze, and J. C. Vera. A geometric preferential attachment model of networks. *Internet Mathematics* 3 (2) (2007); (extended abstract appeared in *Proc. of 3rd International Workshop on Algorithms and Models for the Web-Graph (WAW)* (2004) 44-55).

A. D. Flaxman, A. M. Frieze, and J. C. Vera. On the average case performance of some greedy approximation algorithms for the uncapacitated facility location problem. *Combinatorics, Probability, and Computing* 16 (2007) 713-732; (extended abstract appeared in *Proc. of the 37th ACM Symposium on the Theory of Computing (STOC)* (2005) 441-449).

A. D. Flaxman and A. M. Frieze. The diameter of randomly perturbed digraphs and some applications. *Random Structures and Algorithms* 30 (4) (2007) 484-504; (extended abstract appeared in *Proc. of the 7th International Workshop on Approximation Algorithms for Combinatorial Optimization Problems and 8th International Workshop on Randomization and Computation (RANDOM-APPROX)* (2004) 345-356).

M. Dyer, A. D. Flaxman, A. M. Frieze, and E. Vigoda. Randomly coloring sparse random graphs with fewer colors than the maximum degree. *Random Structures and Algorithms* 29, (2006) 450-465.

A. D. Flaxman, A. M. Frieze, and M. Krivelevich. On the random 2-stage minimum spanning tree. *Random Structures and Algorithms* 28 (2) (2006) 24-36; (extended abstract appeared in *Proc. of the 16th Symposium on Discrete Algorithms (SODA)* (2005) 919-928).

U. Feige, A. D. Flaxman, J. D. Hartline, and R. Kleinberg. On the competitive ratio of the random sampling auction. *Proc. of the 1st International Workshop on Internet and Network Economics* (2005) 878-886.

A. D. Flaxman and B. Przydatek. Solving medium-density subset sum problems in expected polynomial time. *Proc. of the 22nd Symposium on Theoretical Aspects of Computer Science (STACS)* (2005) 305-314.

A. D. Flaxman, A. T. Kalai, and H. B. McMahan. Online convex optimization in the bandit setting: gradient descent without a gradient. *Proc. of the 16th Symposium on Discrete Algorithms (SODA)* (2005) 385-394.

A. D. Flaxman, D. Gamarnik, and G. B. Sorkin. Embracing the giant component. *Random Structures and Algorithms* 27 (3) (2005) 277-289; (extended abstract appeared in *Proc. of the 6th Conference of Latin American Theoretical Informatics (LATIN)* (2004) 69-79).

A. D. Flaxman, A. M. Frieze, and T. Fenner. High degree vertices and eigenvalues in the preferential attachment graph, *Internet Mathematics* 2 (1)

(2005) 1-19; (extended abstract appeared in *Proc. 7th International Workshop on Randomization and Approximation Techniques in Computer Science (RANDOM-APPROX)* (2003) 264-274).

A. D. Flaxman. A sharp threshold for a random constraint satisfaction problem. *Discrete Math.* 285/1-3 (2004) 301-305.

A. D. Flaxman, A. M. Frieze, and E. Upfal. Efficient communication in an ad-hoc network. *J. Algorithms* 52 (1) (2004) 1-7.

A. D. Flaxman, A. W. Harrow, and G. B. Sorkin. Strings with maximum numbers of distinct subsequences and substrings. *Elec. J. Combinatorics* 11 (1) R8 (2004).

Selected Presentations

GATES GRAND CHALLENGE 13 PROJECT-WIDE MEETING
Dar es Salaam, Tanzania

Oct. 21-24, 2009

Title: Computational Algorithms for Verbal Autopsy

FOO CAMP EAST
March 27-29, 2009
Cambridge, MA

Ignite Talk: What is the Global Burden of Disease?

MIDWEST THEORY DAY
Dec. 6, 2008
Evanston, IL

Invited Talk: Theoretical Computer Science for Global Health

HARVEY MUDD COLLEGE MATHEMATICS CONFERENCE ON PUBLIC SECTOR OPERATIONS RESEARCH
Sept. 29, 2007
Claremont, CA

Poster: Identifying entitlement to share in a class action settlement.

4TH WORKSHOP ON ALGORITHMS AND MODELS FOR THE WEB-GRAPH
Banff, BC

Nov. 30–Dec. 1, 2006

Title: Expansion and lack thereof in randomly perturbed graphs.

37TH ANNUAL ACM SYMPOSIUM ON THEORY OF COMPUTING
May 21–24, 2005
Baltimore, MD

Title: On the average case performance of some greedy approximation algorithms for the uncapacitated facility location problem.

16TH ANNUAL ACM-SIAM SYMPOSIUM ON DISCRETE ALGORITHMS
Vancouver, BC

