Clifford Stein

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Research Interests

Design and analysis of algorithms, combinatorial optimization, scheduling, green computing, big data, network algorithms, algorithm engineering.

Education

Massachusetts Institute of Technology
Ph.D. in Electrical Engineering and Computer Science, August, 1992.
Thesis: *Approximation Algorithms for Multicommodity Flow and Shop Scheduling.*
Advisor: David Shmoys.

Massachusetts Institute of Technology
M.S. in Electrical Engineering and Computer Science, August, 1989.
Thesis: *Using Cycles and Scaling in Parallel Algorithms.*
Advisor: David Shmoys.

Princeton University
B.S.E. Summa cum Laude in Computer Science, June, 1987.
Thesis: *Efficient Algorithms for Bipartite Network Flow.*
Advisor: Robert Tarjan.

Honors and Awards

Best paper, ICALP, 2015
ACM Fellow, 2012–present
Alfred Sloan Research Fellow, 1999–2003
Karen Wetterhahn Award for Distinguished Creative or Scholarly Achievement, 1998
NSF CAREER Award, 1996–2000
Dartmouth Faculty Fellowship, 1996
NSF Research Initiation Award, 1993–1996
AT&T Bell Laboratories Graduate Fellowship, 1990–1992
General Electric Fellowship, 1988–89
NSF Graduate Fellowship, Honorable Mention, 1987
Phi Beta Kappa, elected 1987
Sigma Xi, elected 1987
Tau Beta Pi, elected 1985

Professional Experience

Professor — *Columbia University Department of Industrial Engineering and Operations Research*
2004–present.

Department Chair — *Columbia University Department of Industrial Engineering and Operations Research*
2008–2013.

Associate Professor — *Columbia University Department of Industrial Engineering and Operations Research*
2001–2004.

Professor — *Columbia University Department of Computer Science*
2001–present.

Member — *Columbia University Data Science Institute*
2012–present.

Visiting Professor — *Google Research, New York*
2006-present.

Consultant — *Sandia National Laboratory*
December, 2013; August, 2013; January, 2013; December, 1998; February, 1996; July, 1994; July, 1993.

Expert Consultant — *U.S. Court of International Trade*
2009

Adjunct Professor — *Dartmouth College Department of Computer Science*
2001–2007.

Associate Professor — *Dartmouth College Department of Computer Science*
1998–2001.

Assistant Professor — *Dartmouth College Department of Computer Science*
1992–1998.

Visiting Scholar — *Stanford University Department of Computer Science*
January – June, 1996.

Consultant — *NEC Research Laboratory*
July 1998; July, 1997; August, 1996; March, 1996; August, 1995.

Consultant — *Rubin Scientific Evaluation Group*
February, 2002 – 2006.

Consultant — *AT&T Bell Laboratories*
Summer, 1991. Mathematical Science Research Group.

External Funding

2018–2019 *SPX: Collaborative Research: Secure and Massive Parallel Computing*, co–PI, NSF SPX, $68,000 out of $205,000.

2018–2019: *SODA 2019 Travel Grant*, NSF CCF, $15,000.

2017–2020: *AF:Small:Beyond Worst Case Running time: Algorithms for Routing, Scheduling and Matching*, NSF CCF, $490,000.

2017–2020: *TRIPODS:From Foundations to Practice of Data Science and Back:*, NSF CCF, $1,500,000, co–PI.

2017–2018: *SODA 2018 Travel Grant*, NSF CCF, $15,000.

2016–2017: *SODA 2017 Travel Grant*, NSF CCF, $20,000.

2015–2016: *SODA 2016 Travel Grant*, NSF CCF, $15,000.

2014–2017: *AF:Small: Scheduling and Routing: Algorithms with novel cost measures,* NSF CCF, $417,277.

2014–2015: *Altair Gift*, $60,000.

2014–2015: *SODA 2015 Travel Grant*, NSF CCF, $15,000.

2013–2015: *Scheduling with Resource Constraints*, NSF CCF, $99,993.

2013–2014: *SODA 2014 Travel Grant*, NSF CCF, $15,000.

2013–2014: *Spectral Learning and LP Relaxations for Latent–Variable Models in NLP*, Google Research Award, joint with Michael Collins, $66,022.

2009–2013: *AF: Small: Online Scheduling Algorithms for Networked Systems and Applications*, NSF CCF, coPI, $167,000 of a $400,000 grant.

2007–2011: *Efficient Algorithms for Problems in the Next Generation of Computing*, NSF, $300,000

2006–2007: *IBM Faculty Fellowship*, $10,000.

2004–2005: *Improving the Undergraduate IEOR Programs at Columbia University*, co-PI with Guillermo Gallego, $100,000.

1999–2003: Alfred Sloan Research Fellowship, $35,000.

1999-2004: *Approximation-Based Techniques for Resource Constrained Scheduling Problems*, NSF, co-PI with Joel Wein, $223,000 of a $392,700 grant.

1998: Karen Wetterhahn Award for Distinguished Creative or Scholarly Achievement, Dartmouth College, $2500.

1996–2000: *Efficient Algorithms in Scheduling, Network Algorithms and Biology: Theory and Practice*, Principal Investigator, NSF CAREER Award, $199,768 plus $6000 matching funds from Dartmouth College.

1996: *Improved Algorithms for Network Optimization and DNA sequencing*, Faculty Fellowship, Dartmouth College, $700.

1995–1999: *Mathematics Across the Curriculum*, a National Science Foundation education grant, joint with approximately 40 other faculty from across the college, total of $4,000,000.

1994–1997: *Large-Address-Space Operating Systems, Parallel I/O, and Algorithms on a Digital 2100 Server*, Principal Investigator, with co-PIs Thomas Cormen and David Kotz. DEC External Research funded $52,037.

1993–1996: *Network Optimization: Flows, Cuts and Scheduling*, Principal Investigator, NSF Research Initiation Award, $46,528 plus $10,000 matching funds from Dartmouth College.

1992–1995: Dartmouth College Burke Award, $15,000.

External Funding In Review

2020–2024: *SPX: Collaborative Research: Secure and Massive Parallel Computing*, NSF CCF, co-PI, $333,333 out of a requested $1,000,000.

2019–2023: *Graph Orientations and Their Algorithmic Applications*, US-Israel Binational Science Foundation, co-PI, $82,000 out of a requested $250,000.

2019–2023: *HDR DSC: Collaborative Research: New York City Data Science Corps*, NSF, senior personel, $2,000,000 requested.

Publications

Accepted Journal Articles (in reverse chronological order)

J1. *Advance Service Reservations with Heterogeneous Customers.*
with V.A. Truong and X. Wang. *Management Science*, To appear, 2019.

J2. *Resource cost aware scheduling.*
with R. Carrasco and G. Iyengar. *European Journal of Operational Research*, 269(2), 621–632,2018.

J3. *Max-min fair rate allocation and routing in energy harvesting networks: algorithmic analysis.*
with Jelena Marasevic and Gil Zussman. *Algorithmica*, 78(2): 521–557, 2017.

J4. *Single Machine Scheduling with Job-Dependent Nonlinear Cost and Arbitrary Precedence Constraints.*
with R. Carrasco and G. Iyengar. *OR Letters*, 41(5): 436–441, 2013.

J5. *Online Scheduling of Packets with Agreeable Deadlines.*
with J. Lukasz, F. Li and J. Sethuraman. *ACM Transactions on Algorithms*, 9(1): 5, 2012.

J6. *FairTorrent: a Deficit-based Distributed Algorithm to Ensure Fairness in Peer-to-Peer Systems.*
with J. Nieh and A. Sherman. *IEEE/ACM Transactions on Networking*, IEEE/ACM Trans. Networking 20(5): 1361–1374, 2012.

J7. *Solving Maximum Flow Problems on Real World Bipartite Graphs.*
with S. Negruseri, M. Pasio, B. Stanley, and C. Strat. *ACM Journal of Experimental Algorithms*, 16, 2011.

J8. *Approximating Semidefinite Packing Programs.*
with G. Iyengar and D. Phillips. *SIAM J. on Optimization*, 21(1): 231–268, 2011.

J9. *On distributing symmetric streaming computations.*
with J. Feldman, S Muthukrishnan, A. Sidiropoulos, and Z. Svitkina. *ACM Transactions on Algorithms* 6(4), 2010.

J10. *An $O(n^{5/2})$ Algorithm for the Rectilinear Minimum Link-Distance Problem in Three Dimensions.*
with R Drysdale and D. Wagner. *Computational Geometry, Theory and Applications*, 42(5): 376–387, 2010.

J11. *Bounded-space online bin cover.*
with E. Asgiersson. J. Scheduling, 12:461–474, 2009.

J12. *Divide-and-Conquer Approximation Algorithm for Vertex Cover.*
with E. Asgiersson. SIAM J. Discrete Math, 23:3, 1261–1280, 2009.

J13. *Speed Scaling for Weighted Flow Time.*
with N. Bansal and K. Pruhs. *SIAM J. Comp*, 39(4): 1294-1308, 2009.

J14. *LP Decoding Corrects a Constant Fraction of Errors.*
with J. Feldman, R. Servedio, T. Malkin, M. Wainwright. To appear in *IEEE Transactions on Information Theory*, 53(1): 82-89, 2007.

J15. *Rounding Algorithms for a Geometric Embedding Relaxation of Minimum Multiway Cut.*
with D. Karger, P. Klein, M. Thorup, N. Young. *Math of OR*, 29(3), pp. 436–461, 2004.

J16. *Approximating Disjoint-Path Problems Using Greedy Algorithms and Packing Integer Programs.*
with S. Kolliopoulos. In *Mathematical Programming*, 99, 2004.

J17. *Optimal Time Critical Scheduling via Resource Augmentation.*
with C. Phillips, E. Torng, and J. Wein. In *Algorithmica*, 32, 2002.

J18. *Approximation Algorithms for Single-Source Unsplittable Flow.*
with S. Kolliopoulos. In *SIAM J. Computing*, 31(3):919-946, 2002.

J19. *Reducing Mass Degeneracy in SAR by MS by Stable Isotopic Labeling.*
with C. Bailey-Kellog, B. Donald, and J. Kelley. In *Journal of Computational Biology*, 8(1):19-36, 2001.

J20. *Approximation Techniques for Average Completion Time Scheduling.*
with C. Chekuri, R. Motwani, and B. Natarajan. In *SIAM J. Computing*, 31(1):146-166, 2001.

J21. *Finding Real-Valued Single-Source Shortest Paths in $o(n^3)$ Expected Time.*
with S. Kolliopoulos. In *J. Algorithms* 28(1):125-141, July 1998.

J22. *A $2\frac{2}{3}$ Approximation Algorithm for the Shortest Superstring Problem.*
with C. Armen. In *Discrete Applied Mathematics*, 88, 1998.

J23. *Minimizing Average Completion Time in the Presence of Release Dates.*
with C. Phillips and J. Wein. In *Mathematical Programming B*, 82, 1998.

J24. *Job Scheduling in Rings.*
with P. Fizzano, D. Karger and J. Wein. In *Journal of Parallel and Distributed Computing*, 34:2, 1997.

J25. *Improved Bounds on Relaxations of a Parallel Machine Scheduling Problem.*
with S. Chakrabarti, C. Phillips, A. Schulz, D. Shmoys, and J. Wein. In *Journal of Combinatorial Optimization*, 1, 1998.

J26. *On the Existence of Schedules that are Near-Optimal for both Makespan and Total Weighted Completion Time.*
with J. Wein. In *Operations Research Letters*, 21, 1997.

J27. *Task Scheduling in Networks.*
with C. Phillips and J. Wein. In *SIAM Journal on Discrete Mathematics*, 10:4, 1997.

J28. *A New Approach to the Minimum Cut Problem.*
with D. Karger. In *Journal of the ACM*, 43:4, July, 1996.

J29. *Short Superstrings and the Structure of Overlapping Strings.*
with C. Armen. In *Journal of Computational Biology*, 2, 1995.

J30. *Fast Approximation Algorithms for Multicommodity Flow Problems.*
with F. T. Leighton, F. Makedon, S. Plotkin, É. Tardos and S. Tragoudas. In *Journal of Computer and System Sciences*, 50, 1995.

J31. *Improved Algorithms for Bipartite Network Flow.*
with R. Ahuja, J. Orlin and R. Tarjan. In *SIAM Journal on Computing*, 23:5, 1994.

J32. *Improved Approximation Algorithms for Shop Scheduling Problems.*
with D. Shmoys and J. Wein. In *SIAM Journal on Computing*, 23:5, 1994.

J33. *Faster Approximation Algorithms for the Unit Capacity Concurrent Flow Problem with Applications to Routing and Finding Sparse Cuts.*
with P. Klein, S. Plotkin and É. Tardos. In *SIAM Journal on Computing*, 23, June, 1994.

J34. *Implementation of a Combinatorial Multicommodity Flow Algorithm.*
with T. Leong and P. Shor. In *DIMACS Series in Discrete Mathematics and Theoretical Computer Science: First DIMACS Implementation Challenge: Network Flows and Matching*, D. Johnson and C. McGeoch, ed. 1993.

J35. *Parallel Algorithms for the Assignment and Minimum-Cost Flow Problems.*
with J. Orlin. In *Operations Research Letters*, 14, 1993.

J36. *A Parallel Algorithm for Approximating the Minimum Cycle Cover.*
with P. Klein. In *Algorithmica*, 9, 1993.

J37. *Approximating the Minimum-Cost Maximum Flow is $\mathcal{P}$-Complete.*
with J. Wein. In *Information Processing Letters*, 42, 1992.

J38. *A Parallel Algorithm for Eliminating Cycles in Undirected Graphs.*
with P. Klein. In *Information Processing Letters*, 34:6, 1990.

Submitted Journal Articles

S1. *Minimizing Maximum Flow Time on Related Machines via Dynamic Posted Pricing.*
with Sungjin Im, Benjamin Moseley, and Kirk Pruhs. Submitted to SIAM Journal on Discrete Mathematics.

Books

B1. *Discrete Mathematics for Computer Science.*
with K. Bogart and S. Drysdale. Pearson, 2010.

B2. *Introduction to Algorithms, 3rd edition.*
with T. Cormen, C. Leiserson and R. Rivest. MIT Press, 2009.

B3. *Discrete Mathematics in Computer Science.*
with K. Bogart and S. Drysdale. Key College Publishing, 2005.

B4. *Introduction to Algorithms, 2nd edition.*
with T. Cormen, C. Leiserson and R. Rivest. McGraw Hill/MIT Press, 2001.

Book Chapters

D1. *Maximum Flows.*
In the *CRC Handbook of Graph Theory*, 2nd Edition, 2013.

D2. *Scheduling Algorithms.*
with D. Karger and J. Wein. In the *CRC Handbook on Algorithms*, 2nd Edition, 2009.

D3. *Scheduling.*
with K. Pruhs. Area Editor for *Encyclopedia of Algorithms*, 2008.

D4. *Maximum Flows.*
In the *CRC Handbook of Graph Theory*, 2004.

D5. *Scheduling Algorithms.*
with D. Karger and J. Wein. In the *CRC Handbook on Algorithms*, 1998.

Refereed Conference Articles (in reverse chronological order)

(starred papers were invited to a special journal issue for the best papers in the conference)

C1. *A general framework for handling commitment in online admission control.*
with Lin Chen, Francizka Eberle, Nicole Megow, and Kevin Schewior. To appear in the proceedings of IPCO 2019.

C2. *Submodular Secretary Problem with Shortlists.*
with Shipra Agrawal, and Mohammad Shadravan. To appear In the proceedings of ITCS 2019.

C3. *Coresets Meet EDCS: Algorithms for Matching and Vertex Cover on Massive Graphs.*
with Sepehr Assadi, MohammadHossein Bateni, Aaron Bernstein, and Vahab S. Mirrokni. In the proceedings of the *30th Symposium on Discrete Algorithms*, 2019.

C4. *Parallel Graph Connectivity in Log Diameter Rounds.*
with Alexandr Andoni, Zhao Song, Zhengyu Wang and Peilin Zhong. In *Proceedings of 59th Annual IEEE Symposium on the Foundations of Computer Science*, 2018.

C5. *Dynamic Matching: Reducing Integral Algorithms to Approximately-Maximal Fractional Algorithms.*
with Moab Arar, Shiri Chechik, Sarel Cohen and David Wajc. In the proceedings of *45th International Colloquium on Automata, Languages, and Programming*, 2018.

C6. *Fast Algorithms for Knapsack via Convolution and Prediction.*
with MohammadHossein Bateni, MohammadTaghi Hajiaghayi, and Saeed Seddighin. In *Proceedings of the 50th Annual ACM Symposium on Theory of Computing*, 2018.

C7. *The Online Set Aggregation Problem.*
with Rodrigo A. Carrasco, Kirk Pruhs, and Jos Verschae. In the proceedings of *Theoretical Informations, the 13th Latin Symposium*, 2018.

C8. *Scheduling When You Don't Know the Number of Machines.*
with Mingxian Zhong. In the proceedings of the *29th Symposium on Discrete Algorithms*, 2018.

C9. *Minimizing Maximum Flow Time on Related Machines via Dynamic Posted Pricing.*
with Sungjin Im, Benjamin Moseley, and Kirk Pruhs. In the proceedings of the *European Symposium on Algorithms*, 2017.

C10. *Extending Search Phases in the Micali-Vazirani Algorithm.*
with Michael Huang. In the proceedings of *Symposium on Experimental Algorithms*, 2017.

C11. *An $O(\log \log m)$-Competitive Algorithm for Online Machine Minimization.*
with Sungjin Im, Benjamin Moseley, and Kirk Pruhs. In the proceedings of *39th Real Time System Symposium*, 2017.

C12. *Simultaneously Load Balancing for Every p-norm, With Reassignments.*
with Aaron Bernstein, Tsvi Kopelowitz, Seth Pettie, and Ely Porat. In proceedings of ITCS 2017.

C13. *Towards a Convex HMM Surrogate for Word Alignment.*
with Andrei Simion and Michael Collins. In the proceedings of *Conference on Empirical Methods in Natural Language Processing*, 2016.

C14. *A Fast Distributed Stateless Algorithm for alpha-Fair Packing Problems.*
with Jelena Marasevic and Gil Zussman. In the proceedings of *43rd International Colloquium on Automata, Languages, and Programming*, 2016.

C15. *Experimental Analysis of Algorithms for Coflow Scheduling.*
with Zhen Qiu and Yuan Zhong. In the proceedings of *15th Symposium on Experimental Algorithms*, 2016.

C16. *An Empirical Study of Online Packet Scheduling Algorithms.*
with Nourhan Sakr. In the proceedings of *15th Symposium on Experimental Algorithms*, 2016.

C17. *Faster Fully Dynamic Matching with Small Approximation Ratios.*
with A. Bernstein. In the proceedings of *27th ACM-SIAM Symposium on Discrete Algorithms*, 2016.

C18. *A 2-Competitive Algorithm For Online Convex Optimization With Switching Costs.*
with Nikhil Bansal, Anupam Gupta, Ravishankar Krishnaswamy, Kirk Pruhs, Kevin Schewior. In *Proceedings of APPROX-RANDOM*, 2015.

C19. *On a Stricly Convex IBM Model .*
with A. Simion, M. Collins. In *Proceedings of EMNLP*, 2015.

C20.* *Fully Dynamic Matching in Bipartite Graphs.*
with A. Bernstein. In proceedings of *42rd International Colloquium on Automata, Languages, and Programming*, 2015.

C21. *Minimizing the Total Weighted Completion Time of Coflows in Datacenter Networks.*
with Z. Qui and Y. Zhong. In *Proceedings of Symposium on Parallel Algorithms and Architectures*, 2015.

C22. *A Family of Latent Variable Convex Relaxations for IBM Model 2.*
with A. Simion, M. Collins. In *Proceedings of AAAI*, 2015.

C23. *Max-min fair rate allocation and routing in energy harvesting networks: algorithmic analysis.*
with J. Marasevic and G. Zussman. In *Proceedings of MobiHoc 2014*: 367-376, 2014.

C24. *Cluster Before You Hallucinate: Approximating Node-Capacitated Network Design and Energy Efficient Routing.*
with R. Krishnasawamy, V. Nagarajan and K. Pruhs. In *Proceedings of the 46th Annual ACM Symposium on Theory of Computing*, 2014.

C25. *Some Experiments with a Convex IBM Model 2.*
with M. Collins and Andrei Simion. In the proceedings of *European Chapter of the Association for Computational Linguistics*, 2014.

C26. *Hallucination Helps: Energy Efficient Virtual Circuit Routing.*
with A. Antonaiadis, S. Im, R. Krishnasawamy, B. Moseley, V. Nagarajan and K. Pruhs. In the proceedings of *25th ACM-SIAM Symposium on Discrete Algorithms*, 2014.

C27. *Maintaining Assignments Online: Matching, Scheduling, and Flows.*
with A. Gupta and A. Kumar. In the proceedings of *25th ACM-SIAM Symposium on Discrete Algorithms*, 2014.

C28. *A Convex Alternative to IBM Model 2.*
with M. Collins and Andrei Simion. In the proceedings of *Conference on Empirical Methods in Natural Language Processing*, 2013.

C29. *The Complexity of Scheduling for p-norms of Flow and Stretch.*
with Benjamin Moseley and Kirk Pruhs. In the proceedings of *Sixteenth Symposium on Integer Programming and Combinatorial Optimization*, 2013.

C30. *Multicast Routing for Energy Minimization Using Speed Scaling.*
with Nikhil Bansal, Anupam Gupta, Ravishankar Krishnaswamy, Viswanath Nagarajan and Kirk Pruhs. In *Proceedings of the 1st Mediterranean Conference on Algorithms*, 2012.

C31. *How to Schedule When You Have to Buy Your Energy.*
with K. Pruhs. In *Proceedings of APPROX-RANDOM 2010*: pp. 352-365, 2010.

C32. *Online Stochastic Packing Applied to Display Ad Allocation.*
with J. Feldman, M. Henzinger, N. Korula, V.Mirrokni. In *Proceedings of European Symposium on Algorithms* pp. 182–194, 2010.

C33. *Feasible and accurate algorithms for covering semidefinite programs.*
with G. Iyengar and D. Phillips. In *Proceedings of SWAT 2010*, pp. 150–162, 2010.

C34. *FairTorrent: Bringing fairness to peer-to-peer systems.*
with A. Sherman and J. Nieh. In *Proceedings of the 5th International Conference on Emerging Networking Experiments and Technologies*, 133–144, 2009.

C35. *Adding Trust to P2P Distribution of Paid Content.*
with A. Sherman, A. Stavrou, J. Nieh, and A. Keromytis. In the proceedings of *Information Security, 12th International Conference*, 459-474, 2009.

C36.* *Solving Maximum Flow Problems on Real World Bipartite Graphs.*
with S. Negruseri, M. Pasio, B. Stanley, and C. Strat. In the proceedings of *8th Workshop on Experimental Algorithms* , 2009.

C37. *Asymptotic Performance of Non-Forced Idle Time Scheduling Policies in the Presence of Variable Demand for Resources.*
with A. Radovanovic. In proceedings of Allerton Conference, 2008.

C38.* *On distributing symmetric streaming computations.*
with J. Feldman, S. Muthukrishnan, A. Sidiropoulos, Z. Svitkina. In the proceedings of *19th ACM-SIAM Symposium on Discrete Algorithms*, 2008.

C39. *Non-Preemptive Min-Sum Scheduling with Resource Augmentation.*
with N. Bansal, H. Chan, R. Khandekar, K. Pruhs, and B. Schieber. In *Proceedings of 48th Annual IEEE Symposium on the Foundations of Computer Science*, 2007.

C40. *Vertex Cover Approximations on Random Graphs.*
with E. Asgeirsson. In the proceedings of *6th Workshop on Experimental Algorithms* , 2007.

C41. *Models of malicious behavior in sponsored search.*
with D. Phillips. In the Proceedgins of teh 2007 Spring Simultation Conference, 2007.

C42. *Budget Optimization in Search-Based Advertising Auctions.*
with J. Feldman, S. Muthukrishnan and M. Pal. In the proceedings of the *8th ACM Conference on Electronic Commerce*, 2007.

C43. *Speed Scaling for Weighted Flow Time.*
with N. Bansal and K. Pruhs. In the proceedings of *18th ACM-SIAM Symposium on Discrete Algorithms*, 2007.

C44. *Better Online Buffer Management.*
with F. Li and J. Sethuraman. In the proceedings of *18th ACM-SIAM Symposium on Discrete Algorithms*, 2007.

C45. *Grouped Distributed Queues: Distributed Queue, Proportional Share Multiprocessor Scheduling.*
with B. Caprita and J. Nieh. In proceedings of *Twenty Fifth Annual ACM SIGACT SIGOPS Symposium on the Principles of Distributed Computing*, 2006.

C46. *Using Markov Chains to Design Algorithms for Bounded Space On-line Bin Cover.*
with E. Asgiersson. In *Proceedings of Workshop on Algorithm Engineering and Experimentation*, 2006.

C47. *An $O(n^{5/2} \log n)$ algorithm for the Rectilinear Minimum Link Distance Problem.*
with S. Drysdale and D. Wagner. In *Proceedings of the Canadian Conference on Computational Geometry*, 2005.

C48. *Approximation Algorithms for Semidefinite Packing Problems with Applications to Maxcut and Graph Coloring.*
with G. Iyengar and D. Phillips. In the proceedings of *Eleventh Symposium on Integer Programming and Combinatorial Optimization*, 2005.

C49. *Vertex Cover Approximation: Experiments and Observations.*
with E. Asgiersson. In the proceedings of *4th Workshop on Experimental Algorithms* , 2005.

C50. *Group Ratio Round-Robin: O(1) Proportional Share Scheduling for Uniprocessor and Multiprocessor Systems.*
with B. Caprita, W.C. Chan, J. Nieh and H. Zheng. In the proceedings of the *USENIX 2005 Annual Technical Conference*, 2005.

C51. *An optimal on-line algorithm for packet scheduling with agreeable deadlines.*
with F. Li and J. Sethuraman. In the proceedings of *16th ACM-SIAM Symposium on Discrete Algorithms*, 2005.

C52. *LP Decoding Achieves Capacity.*
with J. Feldman. In the proceedings of *16th ACM-SIAM Symposium on Discrete Algorithms*, 2005.

C53. *On the Capacity of Secure Network Coding.*
with J. Feldman, R. Servedio, T. Malkin. In proceedings of Allerton Conference, 2004.

C54. *LP Decoding Corrects a Constant Fraction of Errors.*
with J. Feldman, R. Servedio, T. Malkin, M. Wainwright. In proceedings of *IEEE International Symposium on Information Theory*, 2004.

C55. *Scheduling An Industrial Production Facility.*
with E. Asgiersson, J. Berry, C. Phillips, D. Phillips and J. Wein. In proceedings of *Tenth Symposium on Integer Programming and Combinatorial Optimization*, 2004.

C56. *Minimizing Makespan for the Lazy Bureaucrat Problem.*
with C. Hepner. In the proceedings of *Scandinavian Workshop on Algorithms and Theory*, 2002.

C57. *Existence Theorems, Lower Bounds and Algorithms for Scheduling to Meet Two Objectives.*
with A. Rasala, E. Torng, and P. Uthaisombut. In the proceedings of *13th ACM-SIAM Symposium on Discrete Algorithms*, 2002.

C58. *Scheduling Multi-Task Agents.*
with D. Rus and R. Zie. In proceedings of *Fifth IEEE International Conference on Mobile Agents*, 2001.

C59. *Approximation Algorithms for the Minimum Bends Traveling Salesman Problem.*
with D. Wagner. In proceedings of *Eighth Symposium on Integer Programming and Combinatorial Optimization*, 2001.

C60. *Implementation of a PTAS for scheduling with release dates.*
with C. Hepner. In *Proceedings of Workshop on Algorithm Engineering and Experimentation*, 2001.

C61.* *Clustering Data Without Prior Knowledge.*
with J. Aslam and A. Leblanc. In *Proceedings of Workshop on Algorithm Engineering*, 2000.

C62. *Reducing Mass Degeneracy in SAR by MS by Stable Isotopic Labeling.*
with C. Bailey-Kellog, J. Kelley, B. Donald. In *Proceedings of Intelligent Systems for Molecular Biology*, 2000.

C63. *Approximation Schemes for Minimizing Average Weighted Completion Time with Release Dates.*
with F. Afrati, E. Bampis, C. Chekuri, D. Karger, C. Kenyon, S. Khanna, I. Milis, M. Queyranne, M. Skutella, M. Sviridenko. In *Proceedings of 40th Annual IEEE Symposium on the Foundations of Computer Science*, 1999.

C64. *Experimental evaluation of approximation algorithms for single-source unsplittable flow.*
with S. Kolliopoulos. In proceedings of *Seventh Symposium on Integer Programming and Combinatorial Optimization*, 1999.

C65. *Better Rounding Algorithms for a Geometric Embedding Relaxation of Minimum Multiway Cut.*
with D. Karger, P. Klein, M. Thorup, N. Young. In *Proceedings of the 31st Annual ACM Symposium on Theory of Computing*, 1999.

C66. *Improved Bicriteria Existence Theorems for Scheduling Problems.*
with J. Aslam, A. Rasala, N. Young. In the proceedings of *10th ACM-SIAM Symposium on Discrete Algorithms*, 1999.

C67. *An Implementation of a Combinatorial Approximation Algorithm for Minimum-Cost Multicommodity Flow.*
with A. Goldberg, J. Oldham, S. Plotkin. In proceedings of *Sixth Symposium on Integer Programming and Combinatorial Optimization*, 1998.

C68. *Approximating Disjoint-Path Problems Using Greedy Algorithms and Packing Integer Programs.*
with S. Kolliopoulos. In proceedings of *Sixth Symposium on Integer Programming and Combinatorial Optimization*, 1998.

C69. *Improved Approximation Algorithms for Unsplittable Flow Problems.*
with S. Kolliopoulos. In *Proceedings of 38th Annual IEEE Symposium on the Foundations of Computer Science*, 1997.

C70. *Optimal Time Critical Scheduling via Resource Augmentation.*
with C. Phillips, E. Torng, and J. Wein. In *Proceedings of the 29th Annual ACM Symposium on Theory of Computing*, 1997.

C71. *Approximation Techniques for Average Completion Time Scheduling.*
with C. Chekuri, R. Motwani, and B. Natarajan. In the proceedings of *8th ACM-SIAM Symposium on Discrete Algorithms*, 1997.

C72.* *Experimental Study of Minimum Cut Algorithms.*
with C. Chekuri, A. Goldberg, D. Karger and M. Levine. In the proceedings of *8th ACM-SIAM Symposium on Discrete Algorithms*, 1997.

C73. *A $2\frac{2}{3}$ Approximation Algorithm for the Shortest Superstring Problem.*
with C. Armen. In proceedings of *Combinatorial Pattern Matching*, 1996.

C74. *Finding Real-Valued Single-Source Shortest Paths in $o(n^3)$ Expected Time.*
with S. Kolliopoulos. In proceedings of *Fifth Symposium on Integer Programming and Combinatorial Optimization*, 1996.

C75. *Improved Scheduling Algorithms for Minsum Criteria.*
with S. Chakrabarti, C. Phillips, A. Schulz, D. Shmoys, and J. Wein. In proceedings of *23rd International Colloquium on Automata, Languages, and Programming*, 1996.

C76. *Scheduling Jobs that Arrive Over Time.*
with C. Phillips and J. Wein. In proceedings of *Workshop on Algorithms and Data Structures*, 1995.

C77. *Improved Length Bounds for the Shortest Superstring Problem.*
with C. Armen. In *Proceedings of Workshop on Algorithms and Data Structures*, 1995.

C78. *Long Tours and Short Superstrings.*
with R. Kosaraju and J. Park. In *Proceedings of 35th Annual IEEE Symposium on the Foundations of Computer Science*, Nov. 1994.

C79. *Job Scheduling in Rings.*
with P. Fizzano, D. Karger and J. Wein. In *Proceedings of the Sixth Annual Symposium on Parallel Algorithms and Architectures*, June, 1994.

C80.* *Task Scheduling in Networks.*
with C. Phillips and J. Wein. In *Proceedings of the Fourth Scandinavian Workshop on Algorithm Theory*, July, 1994.

C81.* *An $\tilde{O}(n^2)$ Algorithm for Minimum Cut.*
with D. Karger. In *Proceedings of the 25th Annual ACM Symposium on Theory of Computing*, 1993.

C82.* *Fast Approximation Algorithms for Multicommodity Flow Problems.*
with F. T. Leighton, F. Makedon, S. Plotkin, É. Tardos and S. Tragoudas. In *Proceedings of the 23rd Annual ACM Symposium on Theory of Computing*, 1991.

C83. *Improved Approximation Algorithms for Shop Scheduling Problems.*
with D. Shmoys and J. Wein. In *Proceedings of the Second Annual ACM-SIAM Symposium on Discrete Algorithms*, 1991.

C84. *Leighton-Rao Might Be Practical: Faster Approximation Algorithms for Concurrent Flow with Uniform Capacities.*
with P. Klein and É. Tardos. In *Proceedings of the 22nd Annual ACM Symposium on Theory of Computing*, 1990.

Publicly Available Software

S1. *Minimum cost concurrent multicommodity flow code.*
with A. Goldberg, J. Oldham and S. Plotkin, 1999.

S2. *MINCUTLIB.*
with C. Chekuri, A. Goldberg, D. Karger and M. Levine, 1997.

S3. *Concurrent multicommodity flow code.*
with T. Leong and P. Shor, 1992.

Invited Talks

Approximate Matchings in Massive Graphs via Local Structure

ISAAC, December, 2018

Matching on Large Data Sets

Rutgers, April, 2018
Princeton, March, 2018

Minimizing Maximum Flow Time via Posted Prices

ISMP, July, 2018 Simons Instit
MAPSP, June, 2017

Analyzing Algorithms on Real World Data

Simons Institute for Theoretical Computer Science, November, 2016

Dynamic Matching

Highlights of Algorithms, June 2016

Hallucination Helps: Energy Efficient Virtual Circuit Routing

U.I.U.C, November, 2015
ISMP, July, 2015
MAPSP, June, 2015
Bertinoro, June, 2015
Universidad Adolpho Alphonzo, May, 2015
U.S. Naval Academy, October, 2014
TU Berlin, July, 2014

Maintaining Assignments Online: Matching, Scheduling, and Flows

SODA, January, 2014

Internet Advertising

NY Marketing Analytics Collective, October, 2013

The Complexity of Scheduling for p-norms of Flow and Stretch

MAPSP Conference, June, 2013

Green Scheduling

Dartmouth College, September 2012
Two Sigma, October, 2012
University of Dortmund, February, 2013
Northwestern University, May, 2013

On-line Matching

Dagstuhl Scheduling Meeting, March, 2013

Laudatio for honorary degree of Monkia Henzinger

University of Dortmund, February, 2013

Resource Cost Aware Scheduling

1st Annual Scientific Meeting of Computer Science Institute of Charles University and Institute for Theoretical Computer Science, December, 2012

Scheduling a Large Datacenter

MAPSP Conference, June, 2009
NII Shonan Meeting on Large Scale Distributed Computing, January, 2012

How to Schedule When You Have to Buy Your Energy

MAPSP Conference, June, 2011
ISMP, August, 2012

Algorithms for Flow Problems

Microsoft Summer School in Algorithms, St. Petersburg, Russia, August, 2010

Optimization Problems in Internet Advertising

Triangle Computer Science Distinguished Lecture Series, Novemember, 2009
Dagstuhl Workshop on Algorithm Engineering, June, 2010
Aussios Workshop on Combinatorial Optimization, January, 2011
Columbia University Discrete Mathematics Seminar, March, 2011

Scheduling to Minimize Total Response Time

FOCS Conference, October, 2007
Tufts University, May, 2008
University of Rejkavik, July, 2008
Lipari Summer School on Computer Science, July, 2008
Tel Aviv University, August, 2008
Bar Ilan University, August, 2008
ISMP, August, 2009
Williams College, 2009

New Metrics for the Analysis of Algorithms

Williams College (Sissy Paterson Lecture), April, 2007

Budget Optimization in Search-Based Advertising Auctions

Google New York, October, 2006
Bertinoro Workshop on Adversarial Modeling and Analysis of Communication Networks, November, 2006
Polytechnic University, February, 2007
MAPSP Conference, July 2007

Proportional Share Scheduling for Uniprocessor and Multiprocessor Systems

Luminy Workshop on Scheduling, May, 2006
ISMP, Approximation Algorithms Track, August, 2006

Approximation Algorithms for Semidefinite Packing Problems with Applications to Maxcut and Graph Coloring

ISMP, Approximation Algorithms Track, August, 2006

Packet scheduling with agreeable deadlines

MAPSP Conference, June, 2005

Network Coding via Filtered Secret Sharing
University of Arizona, 2005
Oberwolfoch Workshop on Combinatorial Optimization, November, 2006
Carnegie Mellon University, December, 2006

Dealing with Hard Optimization Problems
Strategic Alliance Capital, 2005

Proving Strong Error Bounds with LP Decoding
Bertinoro Workshop on Combinatorial Optimization, 2004

Scheduling an industrial production facility
Rutgers, February, 2004
Bell Laboratories, March, 2004

What do we know about SRPT?
MIT, October, 2003

Scheduling to simultaneously optimize two metrics
INFORMS, October, 2003
International Symposium on Mathematical Programming, August, 2003
IBM, 2003
Columbia Theory Group Seminar, 2003

Simultaneously optimizing two scheduling objectives
International Workshop on Scheduling and Telecommunications, April, 2001
Technical University of Berlin, June, 2001

Scheduling to Minimize Average Completion Time
Columbia University, April, 2000
Northeastern University, March, 2000
Johns Hopkins University, March, 2000
Carnegie Mellon University, March, 1997

Approximation Schemes for Minimizing Average Weighted Completion Time with Release Dates
International Symposium on Mathematical Programming, August, 2000
DIMACS Workshop on Approximation Algorithms, February 2000
Dagstuhl Workshop on Scheduling in Manufacturing Systems, October, 1999

Improved Approximation Algorithms for Unsplittable Flow Problems
INFORMS, April, 1998
Dagstuhl Workshop on Approximation Algorithms, August, 1997

Optimal Time Critical Scheduling via Resource Augmentation
29th Annual ACM Symposium on Theory of Computing, May, 1997

Minimum Cuts: New Algorithms and Applications
SUNY Albany, April, 1998
International Symposium on Mathematical Programming, August, 1997
Cornell University, April, 1997
Carnegie Mellon University, March, 1997

Designing Schedules that Minimize Average Completion Time

University of California, Berkeley, April, 1996
University of British Columbia, April, 1996
Stanford University, May, 1996

Finding Minimum Cuts in Networks

University of New Hampshire, February, 1995

Long Tours and Short Superstrings

35th Annual IEEE Symposium on Foundations of Computer Science, November, 1994

A $2\frac{3}{4}$ Approximation Algorithm for the Shortest Superstring Problem

Polytechnic University, September, 1994

Approximation Algorithms for the Maximum Travelling Salesman Problem

International Mathematical Programming Symposium, August, 1994

Task Scheduling in Networks

Scandinavian Workshop on Algorithms and Theory, July, 1994

Scheduling Jobs on a Network of Processors

ORSA/TIMS, April, 1994

Scheduling in Networks

DIMACS Workshop on Approximation Algorithms, March, 1993

A Provably Fast and Practical Algorithm for Multicommodity Flow

ORSA/TIMS, May, 1993
Polytechnic University, July, 1992
Dartmouth College, April, 1992
University of Maryland, April, 1992
George Mason University, April, 1992
University of Texas at Austin, March, 1992
University of Waterloo, March, 1992
Northwestern University, March, 1992
AT&T Bell Laboratories, February, 1992
Sandia Laboratories, February, 1992

Implementation of a Combinatorial Multicommodity Flow Algorithm

DIMACS Implementation Challenge Workshop: Network Flows and Matching, October, 1991.

Fast Approximation Algorithms for Multicommodity Flow Problems

23rd Annual ACM Symposium on Theory of Computing, May 1991.

Improved Algorithms for Bipartite Network Flow

ORSA/TIMS, October, 1990
MIT Laboratory for Computer Science, April, 1989.

A New Parallel Graph Decomposition Technique with Applications to Finding a Cycle Cover

5th SIAM Conference on Discrete Mathematics, June 1990

Leighton-Rao Might Be Practical: Faster Approximation Algorithms for Concurrent Flow with Uniform Capacities

22nd Annual ACM Symposium on Theory of Computing, May 1990.

Panel Talks

A.I.'s HUMAN SHADOW: Bias and Error in our Algorithmic Selves
World Science Festival, New York, June, 2018

Algorithmic Accountability Reporting: On the Investigation of Black Boxes
Columbia Journal School, New York, January, 2014

Academic Activities

Undergraduate Courses taught(italicized courses are ones I developed)
Foundations of Data Science, Spring, 2018
Introduction to Mathematical Programming, Fall 2001, Fall 2002, Fall 2003, Fall 2004, Fall 2005, Fall 2006
Discrete Mathematics for Computer Science, Winter 1999, Spring 2000, Winter 2001
Data Structures and Programming, Fall 1992, Fall 1994, Fall 1995, Fall 1996, Fall 1997, Winter 1998, Fall 1998
Introduction to Algorithms, Fall 1993, Fall 1994, Fall 1999
Advanced Algorithms, Winter 1993

Graduate Courses taught (italicized courses are ones I developed)
Computational Approaches to Energy, Fall, 2014
Optimization II, Spring 2009, Spring 2011, Spring 2012, Spring 2014, Spring 2016
Matching Algorithms, Fall 2012, Fall 2018
Scheduling Algorithms, Fall 2007, Fall 2016
Randomized Algorithms, Spring 2005
Approximation Algorithms, Fall 1993, Spring 2003
Network Flows, Fall 2001, Spring 2006, Spring 2007
Data Structures and Algorithms, Fall 1997, Fall 1999

Mixed Undergraduate/Graduate Courses taught (italicized courses are ones I developed)
Randomized Algorithms, Spring 1995
Analysis of Algorithms, Fall 2002, Fall 2003, Fall 2005, Fall 2007, Fall 2009, Fall 2011, Fall 2013, Fall 2015, Fall 2017, Spring 2019
Production Scheduling, Spring 2002, Spring 2003, Spring 2004, Spring 2005, Spring 2009, Spring 2010, Spring 2011, Spring 2013, Spring 2014, Spring 2016, Spring 2017, Spring 2018, Spring 2019
Applied Integer Programming, Spring, 2007, Spring 2017
Scheduling Algorithms, Winter 1997, Spring 1999
Concrete Mathematics, Winter 1995
Network Flows, Winter 2001, Fall, 1997, Spring 1993

Research Supervision

Postdocs

Tsvi Kopelowitz, 2018
Ravishankar Krishnaswamy, 2015
Jon Feldman, 2004–2006

Ph.D. theses advised

Mingxian Zhong, Columbia IEOR (joint with M. Chudnovsky) *Some Problems in Graph Theory and Scheduling*, August, 2018.
Aaron Bernstein, Columbia Computer Science, *Dynamic Algorithms for Shortest Paths and Matching*, August 2016.
Jelena Maresevic, Columbia Electrical Engineering (joint with G. Zussman), *Resource Allocation in Wireless Networks, Theoy and Applications*, August, 2016.
Zhen Qiu, Columbia IEOR (joint with Y. Zhong), *Approximation Algorithms for Demand-Response Contract Execution and Coflow Scheduling*, February, 2016.
Andrea Simion, Columbia IEOR (joint with M. Collins), *A Family of Latent Variable Convex Relaxations for IBM Model 2*, May 2015.
Tulia Humphries, Columbia IEOR (joint with Jay Sethurman), *On the Kidney Exchange Problem and Online Minimum Energy Scheduling*, June, 2014.
Rodrigo Carrasco, Columbia IEOR (joint with G. Iyengar) , *Resource Cost Aware Scheduling Problems*, May, 2013.
Alex Sherman, *Guaranteeing Performance through Fairness in Peer-to-Peer File-Sharing and Streaming Systems*, August, 2010
Fei Li, *Competitive Queuing Policies for Packet Scheduling*, December, 2007
Eyjolfur Asgiersson, *Simple Algorithms for Hard Combinatorial Problems*, September, 2007
David Phillips, *Optimizing Approximately: Theory and Practice*, September, 2007
David Wagner, *Path Planning Algorithms Under the Link Distance Metric*, (joint with S. Drysdale) February, 2006
Stavros Kolliopoulos, *Exact and Approximation Algorithms for Network Flow and Disjoint Paths Problems*, August, 1998
Chris Armen, *Approximation Algorithms for the Short Superstring Problem*, August, 1995
Perry Fizzano, *Centralized and Distributed Algorithms for Network Scheduling*, June 1995

Ph.D. theses currently supervising

Nouri Sakr, Columbia IEOR
Mohammad Shadravan, Columbia IEOR (joint with S. Agarwal)
Pelin Zhong, Columbia CS (joint with Alex Andoni)
Sandip Sinha, Columbia CS (joint with Alex Andoni)
Sai Mali Ananth, Columbia IEOR
Oussama Hanguir, Columbia IEOR

M.S. theses advised

Clint Hepner, Dartmouth CS, 2006
Bogdan Caprita, Columbia CS (joint with J. Nieh), 2005

Ph.D. thesis committee member

Pavel Veseley, 2018 (Charles University)
Xinshang Wang, 2017 (Columbia University, IEOR)
Chun Ye, 2016 (Columbia University, IEOR)
Itai Feigenbaum, 2016 (Columbia University, IEOR)
Kevin Schewior, 2016 (T.U. Berlin, Math)
Yin-Wen Chang, 2015 (Columbia University, CS)
Peter Maceli, 2015 (Columbia University, IEOR)
Matthew Plummetaz, 2014 (Columbia University, IEOR)
Li Yang Tan, 2014 (Columbia University, CS)
Shyam Chandramouli, 2014 (Columbia University, IEOR)
Alex Michalka, 2013 (Columbia University, IEOR)
Krzysztof Choromanski, 2013 (Columbia University, IEOR)
Irena Penev, 2012 (Columbia University, Math)
Shiqian Ma, 2011 (Columbia University, IEOR)
Serhat Aybat, 2011 (Columbia University, IEOR)
Imran Khan, 2011 (Columba University, Computer Science)
Bert Huang, 2011 (Columbia University, Computer Science)
Xinxin Li, 2011 (Columbia University, Earth and Environmental Engineering)
Ilias Diakonikolas, 2010 (Columbia University, Computer Science)
Spyridon Antonakopoulos, 2009 (Columbia University, Computer Science)
Xioazhu Kang, 2008 (Columbia University, Electrical Engineering)
Jia Zeng, 2007 (Columbia University, Computer Science)
Imre Risi Kondor, 2007 (Columbia University, Computer Science)
Anuj Kumar, 2007 (Columbia University, IEOR)
Danny Hong, 2005 (Columbia University, Electrical Engineering)
Hairong Zhao, 2005 (NJIT, computer science)
Mark Zuckerberg, 2004 (Columbia University, IEOR)
Olga Raskina, 2002 (Columbia University, IEOR)
Brian Brewington, 2000 (Dartmouth College, engineering)
Laura Montague, 2000 (Dartmouth College, mathematics)
Jeffrey Oldham, 1999 (Stanford University, computer science)
Steven Ryan, 1999 (Dartmouth College, mathematics)
Astrid AnHuef, 1999 (Dartmouth College, mathematics)
Chandra Chekuri, 1998 (Stanford University, computer science)
Lawrence Guntner, 1996 (Dartmouth College, mathematics)
Omri Palmon, 1996 (Stanford University, computer science)
Berrin Yanikoglu, 1993 (Dartmouth College, computer science)

M.S. thesis committee

John Thomas, 2004

M.E. thesis supervised

Rajiv Wickremesinghe, 1995

Recent Supervised Master's Research

Markus Schanta, 2012, Samuel Messing, 2012, Varun Jalan, 2009-2010
Sharath Guaraj, 2009

Recent Supervised Undergraduate Research

Christine Chang, 2017
Shawn Xia, 2017
Michael Huang, 2016-7
Ronnie Cheng, 2006
Samuel Gordon, 2003
Karthik Easwar, 2002-2003
Alexander Katsnelson, 2002-2003

Undergraduate Theses Supervised

David Goldberg, *Rainbow Scheduling*, 2006
April Rasala, *Bicriteria Scheduling*, 1999
Jonathan Feldman, *The Complexity of Clerkship Scheduling*, 1997
Matthew Cheyney, *Can Biological Computation be Used to Factor Large Numbers*, 1995
Debbie Lam, *Implementation of a Combinatorial Algorithm for the Multicommodity Flow Problem*, 1991, MIT.

Professional Activities

Associate Editor

- ACM Books, 2014-2016.
- ACM Transactions on Algorithms, 2004-2009.
- Mathematical Programming, 2001-2004.
- Journal of Algorithms, 2001-2004.
- SIAM Journal on Discrete Mathematics, 2000-2004.
- Operations Research Letters, 1999-2003.

Program Committee Chair

- MAPSP, Models and Algorithms for Planning and Scheduling Problems, 2009.
- SODA, Symposium on Discrete Algorithms, 2006.
- ALENEX, Algorithm Engineering and Experimentation, 2002.

Program Committee Member

- ESA, European Symposium on Algorithms, 2019.
- WAOA, Workshop on Approximation and On-line Algorithms, 2017.
- ESA, European Symposium on Algorithms, 2017.
- SPAA, Symposium on Parallel Algorithms and Architectures, 2015.
- SEA, Symposium on Experimental Algorithms, 2015.
- STOC, Symposium on Theory of Computing, 2012.
- WAOA, Workshop on Approximation and On-line Algorithms, 2011.
- ESA, European Symposium on Algorithms, 2011.
- IPCO, Integer Program and Combinatorial Optimization, 2011.
- COCOON, International Computing and Combinatorics Conference, 2010.
- WAOA, Workshop on Approximation and On-line Algorithms, 2010.
- ALENEX, Algorithm Engineering and Experimentation, 2010.
- Ad Auctions, 2009.
- WEA, Workshop on Experimental Algorithms, 2008
- MAPSP, Models and Algorithms for Planning and Scheduling Problems, 2007.
- ESA, European Symposium on Algorithms, 2006.
- MISTA, 2005
- SODA, Symposium on Discrete Algorithms, 2004.
- ISTW, 1st International Workshop on Scheduling and Telecommunications, 2001.
- SODA, Symposium on Discrete Algorithms, 2001.
- SODA, Symposium on Discrete Algorithms, 2000.
- ALENEX, Algorithm Engineering and Experimentation, 2000.

Steering Committee Chair

- SODA, Symposium on Discrete Algorithms, 2013-2019.

- ALENEX, Algorithm Engineering and Experimentation, 2010-2013.

Steering Committee Member

- ALENEX, Algorithm Engineering and Experimentation, 2001-2019.
- MAPSP, Models and Algorithms for Planning and Scheduling Problems, 2009-present.

Organizing Committee Member

- TTIC Workshop on Data Center Scheduling, 2018
- Dagstuhl Scheduling Workshop, 2018
- Dagstuhl Scheduling Workshop, 2016
- ISMP, Approximation and Online Algorithms Track, 2015
- STOC, Local Arrangements Chair, 2014
- New York area Theory Day, 2014
- 2nd NSF Workshop on a Science of Power Management, 2010
- New York area Theory Day, 2010
- ISMP, Approximation Algorithms Track, 2009
- New York area Theory Day, 2007
- ISMP, Approximation Algorithms Track, 2006
- IBM/Columbia/NYU Theory Day, 2005
- IBM/Columbia/NYU Theory Day, 2004

Member, Search committee for editor-in-chief of ACM Journal of Experimental Algorithmics, 2013.

Member, SIAM ad-hoc committee on Conference Proceedings, 2007.

Reviewer of over 80 articles for the journals Algorithmica, Communications of the ACM, Discrete Applied Mathematics, Information Processing Letters, IEEE Transactions on Computers, IEEE Transactions on Parallel and Distributed Computing, International Journal on the Foundations of Computer Science, Journal of Algorithms, Journal of the ACM, Journal of Computational Biology, Journal of Computer and System Sciences, Journal of Parallel and Distributed Computing, Mathematics of Operations Research, Mathematical Programming, Networks, Operations Research, Operations Research Letters, ORSA Journal on Computing, Parallel Processing Letters, SIAM Journal on Computing, SIAM Journal on Discrete Math, and Theoretical Computer Science.

Reviewer multiple times for the conferences International Conference on Automata, Languages and Computing, Symposium on Discrete Algorithms, Symposium on the Foundations of Computer Science, Symposium on the Theory of Computation, European Symposium on Algorithms, Israeli Symposium on Theoretical Computer Science, International Symposium on Automata, Algorithms and Computing, Symposium on Parallel Algorithms and Architectures, and Symposium on Parallel and Distributed Computing.

Panelist for National Science Foundation Grants Panel (11 times).

Reviewer for National Science Foundation Grants in Computer Science and Computational Biology.

Member of ACM, SIAM, SIGACT, Mathematical Programming Society, INFORMS

Columbia Departmental Activities

Department Chair, 2008–2013.

Ph.D. Committee, 2013–present.

Undergraduate Program Committee, Chair, 2002–2008, member 2008–present.

Faculty Search Committee, 2006-2007, Chair 2013–2014. Committee 2014–2015, Chair 2015–2016, Committee 2016–2019

Ph.D. Admission, Member, 2001–2002, Chair, 2002–2003.

Building Renovation Committee, Member 2002–2003, Chair 2013–2014.

Columbia University Activities

SEAS Adademic Review, Cochair, 2018–2019

Committee to create a Data Science Ph.D., 2018–2019.

Committee to Design an Undergraduate Data Science Course, Chair, 2016–2018.

SEAS Executive Committee, Faculty Representative, 2016–2018.

Data and Society Taskforce, Member, 2016–present.

Provosts Grant Program for Junior Faculty who Contribute to the Diversity Goals of the University, Member, 2017 – present.

Packard Fellowship committee , Member, 2017

Google Graudate Fellowship committee , Member, 2016–2018.

DSI education committee, Member, 2016–present.

DSI space committee, Member, 2015–present.

DSI M.S. admissions committee, Member, 2013–present.

DSI lecturer hiring committee, Member, 2013–2015.

Shared Research Computing Policy Advisory, Member, 2011–present.

Global Centers Faculty Steering Committee, Member, 2010–2012.

SEAS Dean Search committee, Member 2007-2009.

Committee on Conflict of Interest Policy, Member, 2008–2009.

University Senate Education Committee, Member, 2004–2006.

University Senate, Member, 2004–2006.

Curriculum Subcommittee on Biology-related Programs, Member, 2004.

Committee on Instruction, Member, 2003-2004.

Committee for Modernizing Graduate Admissions, Member, 2003.

Ad-hoc committee on the library, Member, 2002.

Dartmouth Departmental Activities

Graduate Advisor for the Computer Science Ph.D. Program, 1993–1995, 1996–1998

Ph.D. Admissions Committee, Chair: 1998-1999, Member: 1997–present.

Curriculum Committee, 1995–present.

Undergraduate Program Committee in Computer Science, Chair: 1993-1995, Member, 1992-1993.

Faculty Recruiting Committee, 1998–1999, 1993–5.

Sudikoff Laboratory Building Access Committee, Chair: 1999-present, Member: 1995, 1998-present

Dartmouth Institute for Advanced Graduate Studies (DAGS) steering committee, 1993–1994, Chair of DAGS Fellows program, 1993

Dartmouth College Activities

Tucker Council, 1997–2001.

Jewish Studies Committee, 1996–2001.

Personal

U.S. citizen. Born December 14, 1965, New York City. Married. Three children.

References

Available on Request.