

James B. Orlin
Born: April 19, 1953
Buffalo, New York
U.S. Citizen

Sloan School of Management
M.I.T. E62-570
Cambridge, MA. 02139

EDUCATION:

University of Pennsylvania	B.A.	1974
Caltech	M.S.	1976
University of Waterloo	M. Math	1976
Stanford University	Ph.D.	1981

PRINCIPAL FIELDS OF INTEREST:

Mathematical Programming, Combinatorial and Network Optimization,
Design and Analysis of Algorithms and Heuristics, Logistics.

NAME AND RANK OF OTHER SSM FACULTY IN SAME FIELD:

Arnie Barnett, Professor
Cynthia Barnhart, Professor
Dimitris Bertsimas, Professor
Vivek Farias, Professor
Daniel Freund, Associate Professor
Robert Freund, Professor
David Gamarnik, Professor
Swati Gupta, Associate Professor
Alexandre Jacquillat, Associate Professor
Retsef Levi, Professor
Haihao Lu, Assistant Professor
Tom Magnanti, Institute Professor
Rahul Mazumder, Professor
Georgia Perakis, Professor
Chara Podimata, Assistant Professor
Andy Sun, Professor
Roy Welsch, Professor
Karen Zheng, Professor

HISTORY OF M.I.T. APPOINTMENTS:

Edward Pennell Brooks Professor of Operations Research	July 1, 1998	Current
Professor	July 1, 1987	Current
Associate Professor	July 1, 1983	June 30, 1987
Assistant Professor	July 1, 1979	June 30, 1983
On leave at Erasmus University, Rotterdam	July 1, 1984	June 30, 1985
Sabbatical at Collaborative Research Inc.	August 1, 1992	May 31, 1993
Sabbatical at Frictionless Commerce Inc.	July 1, 2000	June 30, 2001
Sabbatical at CSAIL and the London School of Economics	July 1, 2019	March 24, 2020

SCHOOL AND INSTITUTE COMMITTEES;

Vice Chancellor Search Advisory Committee	August, 2024	December 2024
MacVicar Awards Committee	December 2017	January 2025
Committee on Academic Performance	September 2017	June 2023
d'Arbeloff Awards Committee	October 2016	January, 2017
Ad hoc committee on computational thinking	May 2016	June 2017
Sloan Undergraduate Program Committee	September 1984	Current
Committee on the Undergraduate Prog (CUP)	September 2013	September, 2016
CUP Subcommittee on the HASS Requirement	January 2010	June 2011
Sloan Gender Equity Committee	September 2006	Current
MIT Council on Educational Technology	July 2006	July 2015
Co-director Operations Research Center	July 1998	July 2006
Management Science Area, Head	September 1993	July 2000
Sloan Undergraduate Education Committee	September 1990	July 2019
Chair, Ph.D. Program Committee	January 1989	September 1993

AWARDS:

The INFORMS Optimization Society 2020 Khachiyan Prize. The Khachiyan Prize of the INFORMS Optimization Society was established in 2010 and is awarded annually at the fall INFORMS Annual Meeting to an individual or a team for life-time achievements in the area of optimization.

The ACM SIGecom Test of Time Award, 2016. Recognizes papers published between 10 and 25 years ago that have had “significant impact on research or applications that exemplify the interplay of economics and computation.” Awarded for the paper co-authored with John J. Bartholdi, III (Georgia Tech), entitled “Single Transferable Vote Resists Strategic Voting.”

The Harold Larnder Prize, 2013. The Canadian Operations Research Society awards this prize annually to an individual who has achieved international distinction in operational research.

IEEE Bennett Prize, 2011. This prize is given annually to the best original paper published in any journal financially sponsored or co-sponsored by the Communications Society in the previous three calendar years; for the paper "Oblivious Routing of Highly Variable Traffic in Service Overlays and IP Backbones," co-authored with Murali Kodialam, T. V. Lakshman, and Sudipta Sengupta.

INFORMS Koopman Prize, 2008, named after Bernard Koopman, and awarded by the Military Application Society for the outstanding publication in military operations research. The award was for the paper "Exact and Heuristic

Algorithms for the Weapon-Target Assignment Problem", co-authored with Ravi Ahuja, Arvind Kumar and Krishna Jha.

IEEE Leonard G. Abraham Prize, 2008, given annually to the best original paper published in *IEEE Journal on Selected Areas in Communications* in the past year. For the paper "Preconfiguring IP-over-Optical Networks to Handle Router Failures and Unpredictable Traffic", co-authored with Murali Kodialam, T. V. Lakshman, and Sudipta Sengupta. *Journal on Selected Areas in Communications* Vol. 25, No. 5, June 2007, 934 – 948.

INFORMS Computing Society Prize, 2007, given annually for the best publication on the interface of Operations Research and Computer Science. For the paper "On the Sum-of-Squares Algorithm for Bin Packing" with Janos Csirik, David Johnson, Claire Kenyon, Peter Shor, and Richard Weber. *Journal of the Association of Computing Machinery* 53 (2006), 1-65.

MacVicar Fellow. 2007-2017. Award honors "exemplary and sustained contributions to the teaching and education of undergraduates at MIT."

INFORMS Fellow. 2006. The Fellow Award recognizes members who have made significant contributions to the advancement of operations research and the management sciences, such contributions including service to the professional field and to INFORMS.

EXPLOR Award. 2004. For exemplary performance and leadership in online marketing research, as well as highlight innovative applications in online marketing research initiatives. Awarded by the American Marketing Association. Joint with Ely Dahan, John Hauser and Michael Yee.

Lanchester Prize, 1993. Awarded by the Operations Research Society of America for the best paper or book in Operations Research for the year. Awarded for the book *Network Flows*, co-authored with Ravindra K. Ahuja and Thomas L. Magnanti

Presidential Young Investigator Award. 1985-1990. Awarded by the National Science Foundation.

Fulbright Research Grant 1984-1985. Given by the Netherlands Fulbright Commission.

Co-winner of the 1981 Dissertation Prize Sponsored by the Transportation Group of the Operations Research Society of America.

Co-winner of the 1978 George E. Nicholson, Jr. Student Paper Competition Sponsored by the Operations Research Society of America (Paper [4]).

Finalist of the 1977 Student Paper Competition.

CURRENT PROFESSIONAL MEMBERSHIP:

INFORMS	Member	Since 1977
Association of Computing Machinery	Member	Since 1981
Society for Industrial and Applied Mathematics	Member	Since 1983

SUBJECTS TAUGHT

15.000	Explorations in Management (Discovery subject)
15.053	Optimization Methods in Business Analytics
15.060	Data, Models, and Decisions
15.073J	Logistical and Transportation Planning Methods
15.081J	Introduction to Math Programming
15.082J	Network Optimization
15.083J	Combinatorial Optimization and Integer Programming
15.A18	The Zen of Probability (freshman seminar)

THESIS SUPERVISION:**YEAR COMPLETED****Ph.D.**

Thesis supervisor for David Hunter Title: New Approaches to Maximizing Influence in Large-Scale Social Networks	2019
Thesis supervisor for Rajan Udwan Title: Robust optimization for submodular function minimization.	2018
Thesis supervisor for Berit Johannes Technical University of Berlin Title: New Classes of Complete Problems for the Second Level of the Polynomial Hierarchy	2011
Thesis supervisor for Michael Yee Title: Inferring Noncompensatory Choice Heuristics	2006
Thesis supervisor for Sudipta Sengupta Title: Efficient and Robust Routing of Highly Variable Traffic	2005
Thesis supervisor for Agustin Bompadre Title: Essays in Combinatorial Optimization	2005
Thesis supervisor for Mahesh Kumar Title: Clustering Using Scale-invariant Metrics	2003
Thesis supervisor for Dushyant Sharma Title: Topics in Neighborhood Search	2002
Thesis supervisor for Ozlem Ergun Title: Very Large Scale Neighborhood Search	2001
Thesis supervisor for Charu Aggarwal Title: Faster Algorithms for Some Minimum Cost Flow Algorithms	1996
Thesis supervisor for Yusin Lee Title: Computational Analysis of Network Optimization Algorithms	1993
Thesis supervisor for James Walton Title: Algorithms for Sensor Management	1992
Thesis supervisor for Hershel Safer Title: Fast Approximation Algorithms for Multi-criteria Combinatorial Optimization Problems	1992

Thesis supervisor for Rina Rotshild Schneur 1991
Title: Scaling-based Algorithms for Multicommodity Flows
and Network Flow Problems with Side Constraints

Thesis supervisor for Murali Kodialam 1991
Title: Algorithms for Periodic Graph Problems.

Thesis supervisor for Andrew Boyd 1987
Title: Optimization Problems on Greedoids

Thesis supervisor for Chat Rajapark 1987
Title: Analysis of Algorithms and
Heuristics for Some Clustering Problems

Thesis supervisor for John VandeVate 1985
Title: The Linear Matroid Parity Problem

S.M.

Thesis Supervisor for Donguk Rhee 2015
Title: Faster Fully Polynomial Approximation Schemes for
Knapsack Problems

Thesis Supervisor for John Miller 2007
Title: Large-Scale Dynamic Observation Planning for
Unmanned Surface Vessels

Thesis supervisor for Mohamed Mostagir 2005
Title: Fully Polynomial Time Approximation Schemes for
Sequential Decision Problems

Thesis supervisor for Nattavude Thirathon 2004
Title: Cyclic Exchange Neighborhood Search Technique
for the K-means Clustering Problem

Thesis supervisor for Ashwin Krishnamurthy 2002
Title: A New Approach to Conjoint Analysis

Thesis supervisor for Anurag Chandra 2001
Title: Locomotive Scheduling

Thesis supervisor for Sudipta Sengupta 1998
Title: Inverse approximation schemes

Thesis supervisor for Krishna Bhagatavula Title: Approximate Shortest Path Algorithms for Hierarchical Networks	1997
Thesis supervisor for Viswanathan Lakshmi Title: Genetic Algorithms for Uncapacitated Network Design	1996
Thesis supervisor for I-lin Wang Title: Implementing the Premultiplier Method for the Minimum Cost Flow Problem	1995
Thesis supervisor for Alan Kaufman Title: Algorithms for Assembling Physical Maps	1994
Thesis supervisor for Sougata Datta Title: Algorithms for Assembling Physical Maps from DNA Fingerprints	1994
Thesis supervisor for Kavitha Rajan Title: Analysis of Heuristics for the Hierarchical Network Design Problem	1993
Thesis supervisor for Dipanwita Misra Title: Data Compression for Shortest Path Problems	1992
Thesis supervisor for Robert Huelskamp Title: The Scheduling of Pilots and Students for Air Force Training	1986
Thesis supervisor for Charles Marge Title: An Explainer System for the Transportation Problem	1986

PUBLICATIONS:

2020-Current

- D. Dadush, J.B. Orlin, A. Sidford, and L. Vegh, "From Incremental Transitive Cover to Strongly Polynomial Maximum Flow" (2025). Accepted for publications in the Proceedings of the Symposium on Discrete Algorithms, 2026.
- N. Atkinson, S.C. Ganz, D.S. Hochbaum, J.B. Orlin, "The Strong Maximum Circulation Algorithm: A New Method for Aggregating Preference Rankings" (2025). *INFORMS Journal of Optimization*, 7(2), 142-155.
- J. B. Orlin and L. Vegh, "Directed shortest paths via approximate cost balancing," *Journal of the Association of Computing Machinery* 70, (2022), 1-33.
- Çela, Eranda, Bettina Klinz, Stefan Lendl, James B. Orlin, Gerhard J. Woeginger, and

- Lasse Wulf. "Linearizable Special Cases of the Quadratic Shortest Path Problem." In *International Workshop on Graph-Theoretic Concepts in Computer Science*, (2021) 245-256.
- J.B. Orlin and X. Gong. "A fast max flow algorithm." *Networks* 7 (2021) 287-321.
- L.L. Chen, W. Ma, J.B. Orlin, and D. Simchi-Levi, "Distributionally Robust Max Flows", Proceedings of the first Symposium on Simplicity in Algorithms, (2020), 81-90.

2010-2019

- J.B. Orlin, K. Subramani, and P. Wojciechowski. "Randomized algorithms for finding the shortest negative cost cycle in networks". *Discrete Applied Mathematics* 236, (2018), 387-394.
- J.B Orlin, A.S. Schulz, R. Udwani, "Robust Monotone Submodular Function Maximization," *Mathematical Programming* 172, (2018), 505-537. An earlier version appeared in Proceedings of the 2016 International Conference on Integer Programming and Combinatorial Optimization, 312-324.
- N. Halman, G. Nannicini and J.B. Orlin, "On the complexity of energy storage problems", (2018). *Discrete Optimization* 28, 21-53.
- J.B. Orlin, and A. Sedeño-Noda. "An $O(nm)$ time algorithm for finding the min length directed cycle in a graph." Proceedings of the twentieth-eighth Annual ACM-SIAM Symposium on Discrete Algorithms, 2017.
- I. Joormann, J.B. Orlin, M.E. Pfetsch, "A characterization of irreducible infeasible subsystems in flow networks." *Networks* 68, (2016), 121-129
- D. Bertsimas, E. Nasrabadi, and J.B. Orlin, "On the power of randomization in network interdiction," *OR Letters* 44, (2016), 114-120.
- N. Halman, D. Klabjan, C-L Li, J.B. Orlin, and D. Simchi-Levi, Fully Polynomial Time Approximation Schemes for Stochastic Dynamic Programs, *SIAM J. Discrete Math.*, 28 (2014), 1725–1796.
- N. Halman, G. Nannicini, and J.B. Orlin, "A Computationally Efficient FPTAS for Convex Stochastic Dynamic Programs", *SIAM Journal of Optimization* 25, (2015), 317-350. An earlier version appeared in Proceedings of the European Symposium on Algorithms, (2013), 577-588.
- B. Vaidyanathan and J.B. Orlin, "Fast Algorithms for Convex Cost Flow Problems on Circles, Lines, and Trees." *Networks* 62, (2013), 288-296.
- J. B. Orlin "Max flows in $O(nm)$ time or better." Proceedings of the 2013 Symposium on the Theory of Computing. 765-774.
- E. Elkind, and J.B. Orlin, "On the hardness of finding subsets with equal average." *Information Processing Letters* 113, (2013), 477–480.
- D. Hochbaum and J.B. Orlin, "Simplifications and speedups of the pseudoflow algorithm." *Networks* 61, (2013) 40-57

- M. Ghiyasvand and J.B. Orlin, "An improved approximation algorithm for computing Arrow-Debreu prices." *Operations Research* 60, (2012) 1245-1248.
- N. Halman, J.B. Orlin, D. Simchi-Levi, "Approximating the Nonlinear Newsvendor and Single-Item Stochastic Lot-sizing Problems When Data Is Given By an Oracle." *Operations Research* 60 (2012) 429-446.
- M. Kodialam, T. V. Lakshman, J. B. Orlin, and S. Sengupta. "End-to-end restorable oblivious routing of hose model traffic. *IEEE/ACM Trans. Netw.* 19, 4 (2011), 1223-1236.
- T. Huh, R. Levi, P. Rusmevichientong and J .B. Orlin. "Adaptive Data-Driven Inventory Control Policies Based on Kaplan-Meir Estimator" *Operations Research* 59, (2011) 929–941.
- M. Milanic, J. B Orlin, and G. Rudolf, "Complexity Results for Equistable Graphs and Related Classes" *Annals of Operations Research* 188 (2011), 359-370.
- R. Bland, and J.B. Orlin, "D. Ray Fulkerson" in *Profiles in Operations Research*. International Series in Operations Research & Management Science, 147, ed. by A. Assad and S. Gass. Springer Science (2011), 509-527.
- J.B. Orlin, "Improved Algorithms for Computing Fisher's Market Clearing Prices", Proceedings of the 2010 Symposium on the Theory of Computing.
- M. Dror, J.B. Orlin, and M. Zhu "Packing Shelves with Items that Divide the Shelves' Length: A Case of a Universal Number Partition Problem", *Discrete Mathematics, Algorithms and Applications* 2, (2010) 189-198.
- J. B. Orlin, K. Madduri, K. Subramani, and M. Williamson, "A Faster Algorithm for the Single Source Shortest Path Problem with Few Distinct Positive Lengths." *Journal of Discrete Algorithms* 8, (2010) 189-198.

2000-2009

- S. Iwata and J.B. Orlin, "A Simple Combinatorial Algorithm for Submodular Function Minimization." Proceedings of the twentieth Annual ACM-SIAM Symposium on Discrete Algorithms, (2009) 1230-1237.
- R.K. Ahuja, J. Goodstein, J. Liu, A. Mukherjee, J.B. Orlin, and D. Sharma, "Exact and Heuristic Methods for the Weapon Target Assignment Problem" in Handbook of Military Industrial Engineering. Edited by Adedeji B. Badiru, Marlin U. Thomas. (2009) CRC Press.
- J.B. Orlin, N. Halman, D. Klabjan, M. Mostagir, and D. Simchi-Levi, "A Fully Polynomial Time Approximation Scheme for Single-Item Stochastic Lot-Sizing Problems with Discrete Demand". *Mathematics of Operations Research* 34, (2009), 674-685.
- J.B. Orlin, A. Punnen, and A.S. Schulz, "Integer programming: optimization and evaluation are equivalent." Proceedings of the 11th International Symposium on Algorithms and Data Structures, (2009), 519 - 529.

- M. Kodialam, T. V. Lakshman, Fellow, IEEE, J. B. Orlin, and S. Sengupta, "Oblivious routing of highly variable traffic in service overlays and IP backbones." *IEEE/ACM Transactions on Networking* 17, (2009) 459-472.
- R.K. Ahuja, J.B. Orlin, and O. Şeref. "Incremental Network Optimization: Theory & Algorithms" *Operations Research* 57, (2009) 586-594.
- J.B. Orlin, "A Fast, Simpler Algorithm for the Matroid Parity Problem." Proceedings of the 2008 IPCO conference in Bertolini Italy.
- O. Netzer , O. Toubia , E. Bradlow, E. Dahan , T. Evgeniou , F.M. Feinberg , E.M. Feit , S.K. Hui , J.C. Liechty, J.B. Orlin, and V.R. Rao, "Beyond Conjoint Analysis: Advances in Preference Measurement." *Marketing Letters* 19, (2008) 337-354.
- B. Vaidyanathan, R.K Ahuja, and J.B. Orlin "The Locomotive Routing Problem", *Transportation Science*, 42, (2008) 492-507.
- A. Bompadre and J. B. Orlin, "A Simple Method for Improving the Primal Simplex Method for the Multicommodity Flow Problem", *Networks* 51, (2008), 63-77.
- E.K. Burke, M. Dror, and J.B. Orlin, "Scheduling Malleable Tasks with Interdependent Processing Rates: Comments and Observations", *Discrete Applied Mathematic* 156 (2008) 620-626.
- J.B. Orlin, A.S. Schulz, and S. Sengupta, "On $\square$ -optimization schemes and L-bit precision: alternative perspectives in combinatorial optimization". Extended Abstract. Thirty-Second Annual ACM Symposium on Theory of Computing (STOC '00). *Discrete Optimization* 5, (2008), 550-561.
- M. Kumar and J.B. Orlin, "Scale-invariant Clustering with Minimum Volume Ellipsoids", *Computers and Operations Research* 35, (2008) 1017- 1029.
- D. Nace and J.B. Orlin, "Lexicographically Minimum and Maximum Load Linear Programming Problems", *Operations Research* 55 (2007) 182-187.
- R.K. Ahuja, J. Goodstein, A. Mukherjee, J.B. Orlin, and D. Sharma, "A Very Large-Scale Neighborhood Search Algorithm for the Combined Through-Fleet-Assignment Model", *INFORMS Journal of Computing*. 19, (2007), 416-428
- M. Kodialam, T.V. Lakshman, J.B. Orlin, and S. Sengupta, "Pre-Configuring IP-over-Optical Networks to Handle Router Failures and Unpredictable Traffic", *IEEE Journal on Selected Areas in Communication* 25 (2007) 934-948.
- E. Dahan, J. Hauser, J.B. Orlin, and M. Yee, "Greedoid-Based Noncompensatory Inference", *Marketing Science* 26 (2007), 532-549.
- R.K. Ahuja, K. Jha, J.B. Orlin, and D. Sharma, "Very Large-Scale Neighborhood Search for the Quadratic Assignment Problem", *INFORMS Journal of Computing*. 2007 19, (2007), 646-657.
- M. Dror and J.B. Orlin, "Combinatorial Optimization with Explicit Delineation of the Ground Set by a Collection of Subsets", *SIAM Journal on Discrete Mathematics* 21, (2007), 1019-1034

- R.K. Ahuja, J. Goodstein, J. Liu, A. Mukherjee, J.B. Orlin, and D. Sharma, "Exact and Heuristic Methods for the Weapon Target Assignment Problem", *Operations Research* 55, (2007), 1136–1146.
- J.B. Orlin, "A Faster Strongly Polynomial Time Algorithm for Submodular Function Minimization." In *Integer Programming and Combinatorial Optimization: Proceedings of the 12th International IPCO Conference*, Springer Verlag, Berlin, (2007) 240-251. *Math Programming* 118 (2), 237-251.
- A. Bompadre, M. Dror, and J.B. Orlin, "Probabilistic Analysis of Unit Demand Vehicle Routing Problems", *J. Appl. Probab.* 44, (2007), 259-278.
- C. Myers and J.B. Orlin, "Very Large Scale Neighborhood Search Techniques in Timetabling Problems", E.K. Burke and H. Rudov'a (Eds.): *Proceedings of PATAT 2006*, LNCS 3867, 24–39, 2007. Springer-Verlag Berlin Heidelberg 2007.
- J. Csirik, D.S. Johnson, C.Kenyon, J.B. Orlin, P. Shor, and R. Weber "On the Sum-of-Squares Algorithm for Bin Packing", Extended abstract. Thirty-Second Annual ACM Symposium on Theory of Computing (STOC '00). *Journal of the Association of Computing Machinery* 53 (2006), 1-65.
- M. Dror, Y. Lee, J.B. Orlin, and V. Polishchuk, "The TSP and the Sum of its Marginal Values", *International Journal of Computational Geometry and Applications* 16, (2006) 333-343.
- Ö. Ergun, J.B. Orlin, and A. Steele-Feldman. "Creating Very Large Scale Neighborhoods out of Smaller Ones by Compounding Moves: A Study on the Vehicle Routing Problem", *Journal of Heuristics* 12, (2006), 1381-1231.
- Ö. Ergun and J.B. Orlin, "A Dynamic Programming Methodology in Very Large Scale Neighborhood Search Applied to the Traveling Salesman Problem", *Discrete Optimization* 3 (2006), 78-85.
- Ö. Ergun and J.B. Orlin, "Fast Neighborhood Search for the Single Machine Total Weighted Tardiness Problem ", *OR Letters* 34, (2006), 41-45.
- M. Kodialam, T.V. Lakshman, J.B. Orlin, and S. Sengupta, "A Versatile Scheme for Routing Highly Variable Traffic in Service Overlays and IP Backbones", *Proceedings of the INFOCOM 2006 25th IEEE International Conference on Computer Communications*. (2006) 1-12.
- A. Bompadre, M. Dror, and J.B. Orlin, "Improved Bounds for Vehicle Routing Solutions", *Discrete Optimization* 3, (2006) 299-316.
- R.K. Ahuja, Ö. Ergun, J.B. Orlin and A. Punnen, "Very large-scale neighborhood search: Theory, algorithms and applications" In *Handbook of Approximation Algorithms and Metaheuristics*, T. Gonzalez, ed. (Chapman & Hall/Crc Computer & Information Science Series) 2006.
- J.B. Orlin, R. Ramaswamy and N. Chakravarty. "Sensitivity Analysis for Shortest Path Problems and Maximum Capacity Path Problems in Undirected Graphs", *Mathematical Programming* 102, (2005) 355-369.

- R.K. Ahuja, J. Liu, J.B. Orlin, D. Sharma, and L. Shughart, "Solving Real-Life Locomotive Scheduling Problems", *Transportation Science* 39 (2005) 503-517.
- A. Bompadre and J.B. Orlin, "Using Grammars to Generate Very Large Scale Neighborhoods for the Traveling Salesman Problem and Other Sequencing Problems", Proceedings of the 11th International IPCO Conference, Berlin, Germany. (2005) 437-451.
- R.K. Ahuja, D. Hochbaum, and J.B. Orlin, "A Cut-Based Algorithm for the Nonlinear Dual of the Minimum Cost Network Flow Problem", *Algorithmica* 39, (2004), 189 – 208.
- J.B. Orlin, A. Punnen, and A.S. Schulz, "Approximate Local Search in Combinatorial Optimization", an extended abstract was published in the *Proceedings of the Fifteenth Annual ACM-SIAM Symposium on Discrete Algorithms*, (2004) 580-589. *SIAM Journal on Computing* 33, (2004) 1201-1214.
- R.K. Ahuja, J.B. Orlin, S. Pallottino, M. Scaparra, and M. Scutellà. "A Multi-exchange Heuristic for the Single Source Capacitated Facility Location Problem", *Management Science* 50, (2004) 749-760.
- J.B. Orlin and D. Sharma, "The Extended Neighborhood: Definition and Characterization", *Mathematical Programming* 101, (2004) 537-559.
- R.K. Ahuja, J. Goodstein, J. Liu, A. Mukherjee, and J.B. Orlin, "A Neighborhood Search Algorithm for the Combined Through and Fleet Assignment Model with Time Windows", *Networks* 44, (2004) 160-171.
- R.K. Ahuja, J.B. Orlin, and D. Sharma, "A Composite Neighborhood Search Algorithm for the Capacitated Minimum Spanning Tree Problem," *Operations Research Letters* 31, (2003), 185-194.
- R.K. Ahuja, D. Hochbaum, and J.B. Orlin, "Solving the Convex Cost Integer Dual Network Flow Problem", Appeared in the 1999 IPCO proceedings. *Management Science* 49, (2003), 950-964.
- R.K. Ahuja, J.B. Orlin, S. Pallottino, and M.G. Scutellà, "Dynamic Shortest Paths Minimizing Travel Times and Costs", *Networks*, 41, (2003) 197-205.
- R.K. Ahuja, J. Goodstein, J. Liu, A. Mukherjee, J.B. Orlin, and D. Sharma, "Solving Multi-Criteria Combined Through Fleet Assignment Models", Chapter 13 in *Operations Research in Space and Air*. Edited by Tito A. Ciriani, Giorgio Fasano, Stefano Gliozzi, and Roberto Tadei. Kluwer Academic Publishers, (2003), 233-256.
- C. Aggarwal and J.B. Orlin, "On Multi-Route Maximum Flows in Networks," *Networks* 39, (2002), 43-52.
- R.K. Ahuja, Ö. Ergun, J.B. Orlin, and A. Punnen, "A Survey of Very Large Scale Neighborhood Search Techniques", *Discrete Applied Mathematics* 23 (2002), 75-102.
- R.K. Ahuja, J.B. Orlin, S. Pallotino, and M.G. Scutella, "Minimum Time and Minimum Cost Path Problems in Street Networks with Periodic Traffic Lights", *Transportation Science* 36, (2002) 326-336.

- R.K. Ahuja, J.B. Orlin, P. Sharma, and P. T. Sokkalingam, "A Network Simplex Algorithm with $O(n)$ Consecutive Degenerate Pivots", *OR Letters* 30, (2002), 141-148.
- R.K. Ahuja and J.B. Orlin, "Combinatorial Algorithms for Inverse Network Flow Problems", *Networks* 40, (2002) 181-187.
- K.M.J. de Bontridder, B. J. Lageweg, J.K. Lenstra, J.B. Orlin, and L. Stougie, "Branch and Bound Algorithms for the Test Cover Problem", an extended abstract in Proceedings of the 10th Annual European Symposium on Algorithms (ESA), (2002) 223—233.
- R.K. Ahuja and J.B. Orlin, "A Fast Scaling Algorithm for Minimizing Separable Convex Functions Subject to Chain Constraints", *Operations Research* 49, (2001)
- R.K. Ahuja and J.B. Orlin, "Inverse Optimization, Part I: Linear Programming and General Problem", *Operations Research* 49, (2001), 771-783.
- R.K. Ahuja, J.B. Orlin and D. Sharma, "Multi-exchange Neighborhood Search Algorithms for the Capacitated Minimum Spanning Tree Problem", *Mathematical Programming* 91, (2001), 71-97.
- R.K. Ahuja, J.B. Orlin, and A. Tiwari, "A Greedy Genetic Algorithm for the Quadratic Assignment Problem", *Computers and Operations Research* 27, (2000), 917-934.
- R.K. Ahuja, J.B. Orlin, and P.T. Sokkalingam, "New Polynomial-Time Cycle-Canceling Algorithms for Minimum Cost Flows", *Networks* 36, (2000) 53-63.
- R.K. Ahuja and J.B. Orlin, "A Faster Algorithm for the Inverse Spanning Tree Problem" *Journal of Algorithms* 34, (2000) 177-193.
- R.K. Ahuja, J.B. Orlin, and D. Sharma, "Very large scale neighborhood search", *International Transactions in Operations Research* 7, (2000), 301-317.

1990-1999

- R.K. Ahuja, J.B. Orlin and P.T. Sokkalingam, "Solving inverse spanning tree problems through network flow techniques", *Operations Research* 47, (1999), 291-300.
- R.K. Ahuja, J.B. Orlin, G. Sechi, and P. Zuddas, "Algorithms for the Simple Equal Flow Problem", *Management Science* 45, (1999), 1440-1455.
- L. Fleischer and J.B. Orlin, "Optimal Rounding of Fractional, Stationary, Dynamic Flows When Flows are Instantaneous", *SIAM Journal of Discrete Mathematics* 13 (1999) 145-153.
- R.R. Schneur and J.B. Orlin, "A Scaling Algorithm for Multicommodity Flow Problems", *Operations Research* 46, (1998), 231-246.
- C. Aggarwal, R.K. Ahuja, J. Hao, and J.B. Orlin, "Diagnosing Infeasibilities in Network Flow Problems", *Mathematical Programming* 81, (1998), 263-280.
- P. Mireault, J.B. Orlin, and R.V. Vohra, "A Parametric Worst Case Analysis for a Machine Scheduling Problem". *Operations Research* 45, (1997), 116-125.

- J.B. Orlin, "A Polynomial Time Primal Network Simplex Algorithm for Minimum Cost Flows. *Mathematical Programming* 78, (1997), 109-129.
- C.C. Aggarwal, J.B. Orlin, and R.P. Tai, "Optimized Crossover for the Independent Set Problem", *Operations Research* 45, (1997), 226-234.
- R. K. Ahuja and J.B. Orlin, "Equivalence of Primal and Dual Simplex Algorithms for the Maximum Flow Problem", Sloan School Working paper 3884-96, March 1996. *Operations Research Letters* 20, (1997) 101-108.
- R.K. Ahuja, M. Kodialam A.K. Mishra, and J.B. Orlin, "Computational Investigations of Maximum Flow Algorithms", *European Journal of Operations Research* 97, (1997), 509-542.
- Golfarb, Z. Jin, and J.B. Orlin, "Polynomial-Time Highest-Gain Augmenting Path Algorithms for the Generalized Circulation Problem", *Mathematics of Operations Research* 22, (1997), 793-802.
- R. Shull, A. Shuchat, J.B. Orlin and M.L. Gardner, "Arc Weighting in Hidden Bicircular Networks", *Congressus Numerantium* 125 (1997) 161-171.
- R. K. Ahuja, J.B. Orlin, "Use of Representative Operation Counts in Computational Testings of Algorithms", *Inform Journal of Computing* 8, (1996), 318-330
- R.K. Ahuja and J.B. Orlin, "A Capacity Scaling Algorithm for the Constrained Maximum Flow Problem", *Networks* 25, (1995), 89-98.
- T.J. Hudson, L.D. Stein, S.S. Gerety, A.B. Castle, J.B. Orlin et al, "An STS-based map of the human genome", *Science* 270, (1995), 1945-1954.
- R. K. Ahuja, T.L. Magnanti, J.B. Orlin and M.R. Reddy, "Applications of Network Optimization", Chapter 1 of the *Handbooks in Operations Research and Management Science, Volume 7: Network Models*, eds. M. O. Ball, T. L. Magnanti, C. L. Monma, and G.L. Nemhauser. Elsevier, North Holland, (1995) 1-84.
- R.K. Ahuja, J.B. Orlin, C. Stein, and R.E. Tarjan, "Improved Algorithms for Bipartite Network Flow", *SIAM Journal of Computing* 23, (1994), 906-933.
- J. Hao and J.B. Orlin, "A Faster Algorithm for Finding a Minimum Cut in a Graph", *Journal of Algorithms* 17, (1994), 424-446.
- Y. Lee and J.B. Orlin, "On Very Large Scale Assignment Problems", In *Large Scale Optimization: State of the Art*, W.W. Hager, D. W. Hearn and P.M Pardalos, Editors. Kluwer Academic Publishers, Dordrecht, The Netherlands, (1994), 206-244.
- R. Shull, A.H. Shuchat, J.B. Orlin, and M.L. Gardner, "Recognizing Hidden Bicircular Networks", *Discrete Applied Mathematics* 41, (1993), 13-53.
- S. Mizuno, R. Saigal, and J.B. Orlin, "Determination of Optimal Vertices from Feasible Solutions in Unimodular Linear Programming", *Mathematical Programming* 59, (1993), 23-32.
- J.B. Orlin, S.A. Plotkin, and E. Tardos, "Polynomial Dual Network Simplex Algorithms", *Mathematical Programming* 60, (1993), 255-276.

- J.B. Orlin and C. Stein, "Parallel Algorithms for the Assignment and Minimum Cost Flow Problems", *OR Letters* 14, (1993), 181-186.
- M. Hartmann and J.B. Orlin, "Finding Minimum Cost to Time Ratio Cycles with Small Integral Transit Times", *Networks* 23, (1993), 567-574.
- R.K. Ahuja, T.L. Magnanti, and J.B. Orlin, *Network Flows: Theory, Algorithms, and Applications*, Prentice Hall, Englewood Cliffs, N.J. 1993.
- Bertsimas and J.B. Orlin, "A Technique for Speeding up the Solution of the Lagrangian Dual", *Mathematical Programming* 63, (1994), 23-46.
- J.B. Orlin and R. K. Ahuja, "New Scaling Algorithms for the Assignment and Minimum Cycle Mean Problems", *Mathematical Programming* 54, (1992), 41-56.
- R.K. Ahuja and J.B. Orlin, "The Scaling Network Simplex Algorithm" *Operations Research*, 40, Supplement 1, (1992), S5-S13.
- R.K. Ahuja, A.V. Goldberg, J.B. Orlin, and R.E. Tarjan, "Finding Minimum-Cost Flows by Double Scaling", *Mathematical Programming* 53, (1992), 243-266.
- R.K. Ahuja and J.B. Orlin, "Distance-Directed Algorithms for Maximum Flow and Parametric Maximum Flow Problems", *Naval Research Logistics*, 38, (1990), 413-430.
- R.K. Ahuja, T.L. Magnanti and J.B. Orlin, "Recent Advances in Network Flows", *Siam Review* 33, (1991), 175-219.
- N. Young, R.E. Tarjan and J.B. Orlin, "Faster Parametric Shortest Path and Minimum Balance Algorithms", *Networks*, 21, (1991), 205-221.
- J.J. Bartholdi and J.B. Orlin, "Single Transferable Vote Resists Strategic Voting", *Social Choice and Welfare*, 8, (1991), 341-354.
- J.B. Orlin and J.H. Vande Vate, "Solving the Linear Matroid Parity Problem as a Sequence of Matroid Intersection Problems", *Mathematical Programming*, 47, (1990) 81-106.
- R.K. Ahuja, K. Mehlhorn, J.B. Orlin, and R.E. Tarjan, "Faster Algorithms for the Shortest Path Problem", *Journal of the Association of Computing Machinery* 37, (1990), 213-223.

1977-1989

- R.K. Ahuja and J.B. Orlin, "A Fast and Simple Algorithm for the Maximum Flow Problem", *Operations Research* 37, (1989), 748-759.
- R. Shull, J.B. Orlin, A.H. Shuchat, and M.L. Gardner, "The Structure of Bases in Bicircular Matroids", *Discrete Applied Mathematics*, 23, (1989) 267-283.
- R.K. Ahuja, J.B. Orlin, and R.E. Tarjan, "Improved Time Bounds for the Maximum Flow Problem", *SIAM J. of Computing* 18, (1989), 939-954.
- R.K. Ahuja, T.L. Magnanti, and J.B. Orlin, "Network Flows", Chapter IV of the

- Handbooks in Operations Research and Management Science, Volume 1: Optimization*, eds. G.L. Nemhauser, A.H.G. Rinnooy Kan, and M.J. Todd, North Holland, 1989, 211-369.
- T.L. Magnanti and J.B. Orlin, "Parametric Linear Programming and Anti-Cycling Pivoting Rules", *Mathematical Programming* 41, (1988), 317-325.
- J.B. Orlin, "A Faster Strongly Polynomial Algorithm for the Minimum Cost Flow Problem", Proceedings of the 20th Annual ACM Conference on the Symposium of Computing. ACM Press. (1988), 377-387. *Operations Research* 41, (1993), 338-350.
- J.B. Orlin, "A Dual Version of Tardos's Algorithm for Linear Programming". *O.R. Letters* 5, (1986), 221-226.
- Z. Miller and J.B. Orlin, "NP-completeness for Minimizing Maximum Edge Length in Grid Embeddings", *Journal of Algorithms*, 6, (1985), 10-16.
- A.K. Chakravarty, J.B. Orlin, and U.G. Rothblum, "Consecutive Optimizers for a Partitioning Problem with Applications to Optimal Inventory Grouping for Joint Replenishment", *Operations Research*, 33, (1985), 820-832.
- S.C. Graves and J.B. Orlin, "A Minimum Concave Cost Dynamic Network Flow Problem, with an Application to Lot-Sizing", *Networks*, 15, (1985), 59-71.
- J.B. Orlin, "On the Simplex Algorithm for Networks and Generalized Networks", *Mathematical Programming Study*, 24, (1985), 166-178.
- J.B. Orlin, "Some Very Easy Knapsack/Partition Problems", *Operations Research*, 33, (1985), 1154-1160.
- J.B. Orlin, "A Finitely Convergent Cutting Plane Technique", *Operations Research Letters*, 4, (1985), 1-4.
- J.B. Orlin and U.G. Rothblum, "Computing Optimal Scalings by Parametric Network Algorithms", *Mathematical Programming*, 32, (1985), 1-10.
- R.M. Freund and J.B. Orlin, "On the Complexity of Four Polyhedral Set containment Problems", *Mathematical Programming*, 33, (1985), 1-7.
- J.B. Orlin, "Minimum Convex Cost Dynamic Network Flows", *Mathematics of Operations Research*, 9, (1984), 190-207.
- J.B. Orlin, "Algorithms for Problems on Dynamic/Periodic Graphs", in Progress in Combinatorial Optimization, William Pulleyblank, ed., *Academic Press*, Toronto, 1984, 273-294.
- J.B. Orlin, "Maximum Throughput Dynamic Network Flows", *Mathematical Programming*, 27, (1983), 214-223.
- J.B. Orlin, "Dynamic Matchings and Quasidynamic Fractional Matchings I", *Networks*, 13, (1983), 551-562.
- J.B. Orlin, "Dynamic Matchings and Quasidynamic Fractional Matchings II", *Networks*, 13, (1983), 563-580.

- J.B. Orlin, "A Polynomial Algorithm for Integer Programming Covering Problems Satisfying the Integer Round-up Property", *Mathematical Programming*, 22, (1982), 231-235.
- J.B. Orlin, "Minimizing the Number of Vehicles to Meet a Fixed Periodic Schedule: An Application of Periodic Posets", *Operations Research*, 30, (1982), 760-776.
- A.K. Chakravarty, J.B. Orlin, and U.G. Rothblum, "A Partitioning Problem with Additive Objective with an Application to Optimal Inventory Grouping for Joint Replenishment", *Operations Research*, 30, (1982), 1018-1022.
- J.B. Orlin, M.A. Bonuccelli, and D.P. Bovet, "An $O(n^2)$ Algorithm for Coloring Proper Circular Arc Graphs", *SIAM J. Alg. Disc. Meth.*, 2, (1981), 88-93.
- R.M. Karp and J.B. Orlin, "Parametric Shortest Path Algorithms with an Application to Cyclic Staffing", *Discrete Applied Mathematics*, 3, (1981), 37-45.
- J.B. Orlin, "The Complexity of Dynamic Languages and Dynamic Optimization Problems", *Transactions of the 13th Annual ACM Symposium on The Theory of Computing*, May 1981, 218-227.
- J.J. Bartholdi III, J.B. Orlin, and H.D. Ratliff, "Cyclic Scheduling via Integer Programs with Circular Ones", *Operations Research*, 28, (1980), 1074-1085.
- J.B. Orlin, "Line-digraphs, Arborescences, and theorems of Tutte and Knuth", *Journal of Combinatorial Theory (B)*, 25, (1978), 187-198.
- J.B. Orlin, "Contentment in Graph Theory: Covering Graphs with Cliques", *Indagationes Mathematicae*, 80, (1977), 406-424
- J.B. Orlin, "The Minimal Integral Separator of a Threshold Graph", *Annals of Discrete Mathematics I*, (1977), 415-419.

WORKING PAPERS AND TECHNICAL REPORTS:

- arXiv preprint arXiv:2307.15702E. Nasrabadi, and J.B. Orlin, "Robust optimization with incremental recourse." (2016)
- S.D. Ahipasaoglu, J.B. Orlin, and R. Steinberg, "A Combinatorial Auction Revisited: Refinement and Extension of PAUSE." (2014)
- B. Johannes and J.B. Orlin, "Partial Inverse Optimization is Much Harder than Inverse Optimization." (2013)
- B. Johannes and J.B. Orlin, "The Power of Solution Preserving Transformations." (2013)
- B. Johannes and J.B. Orlin, "Minimax Regret Problems are Much Harder than Minimax Problems." (2013)
- J. B. Orlin, J. Renz, and T. Shirabe, "An Efficient Algorithm for the Minimum Work Path

- Problem,” (2010).
- V. Farias, R. Levi, and J.B. Orlin, and G. Perakis. “Dynamic Pricing with Learning - State-Space Collapse and Fully Polynomial Time Approximation Scheme”. Extended Abstract. (2007).
- J.B. Orlin, and X. Yang. “Maximum Capacity-to-Cost Ratio Path Problem and its Inverse Problem” with Technical Report, October 2006.
- J.B. Orlin, “Sensitivity Analysis for the Critical Path Method.” September 2004.
- R. Agarwal, Ö. Ergun, J.B. Orlin, and C.N. Potts, “Solving Parallel Machine Scheduling Problems with Variable Depth Local Search” (2004).
- H. Safer, J.B. Orlin, and M. Dror. “Fully Polynomial Approximation in Multi-Criteria Combinatorial Optimization.” February 2004.
- T.C. Lai and J.B. Orlin, “The Complexity of Preprocessing.” October 2003.
- H. Safer and J.B. Orlin, "Fast Approximation Schemes for Multi-Criteria Combinatorial Optimization." Sloan School Working paper 3756-95, January 1995.
- H. Safer and J.B. Orlin, "Fast Approximation Schemes for Multi-Criteria Flow, Knapsack, and Scheduling Problems." Sloan School Working paper 3757-95, January 1995.
- Y. Lee and J.B. Orlin, "QuickMatch: A Very Fast Algorithm for the Assignment Problem." MIT Sloan School Working Paper 3547-93. March 1993.
- P.M. Thompson and J.B. Orlin "The Theory of Cyclic Transfers." M.I.T. Operations Research Center Report OR 200-89, 1989.
- H.N. Psaraftis, J.B. Orlin, D. Bienstock, and P. Thompson, "Analysis and Solution Algorithms of Sealift Routing and Scheduling Problems: Final Report." MIT Sloan School Working Paper 1700-85, 1985.
- J.B. Orlin. “Genuinely Polynomial Simplex and Non Simplex Algorithms for the Minimum Cost Flow Problem." MIT Sloan School working paper 1615-84. December, 1984.

INVITED LECTURES: (2015 - Current)

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| January 11, 2026 | Symposium on Discrete Algorithms, Vancouver, Canada. “From Incremental Transitive Cover to Strongly Polynomial Maximum Flow,” with Daniel Dadush, Aaron Sidford, and Laszlo Vegh. |
| July 1, 2024 | EURO Conference, Copenhagen. “From Incremental Transitive Cover to Strongly Polynomial Maximum Flow,” with Daniel Dadush, Aaron Sidford, and Laszlo Vegh. |

November 13, 2023	Berkeley, IEOR Department, "A New Method for Aggregating Preference Rankings," with Nathan, Atkinson, Scott Ganz, and Dorit Hochbaum,
October 31, 2022	Weizman Institute, Rehovot, Israel. "Directed shortest paths via approximate cost balancing," with Laszlo Vegh.
July 5, 2022	EURO Conference, Helsinki, Finland. "Directed shortest paths via approximate cost balancing," with Laszlo Vegh.
January 10, 2021	Symposium on Discrete Algorithms. (Online). "Directed shortest paths via approximate cost balancing," with Laszlo Vegh.
November 9, 2020	INFORMS, (Online). "The Khachiyan Prize."
February 19, 2020	London School of Economics, "The shortest cycle problem and the second shortest path problem," with Antonio Sedeño-Noda.
June 24, 2019	EURO, Dublin, Ireland. "65 years of improvements in max flow algorithms."
October 23, 2019	University of MN. "The shortest cycle problem and the second shortest path problem," with Antonio Sedeño-Noda.
January 14, 2019	MIP Workshop, MIT. "The shortest cycle problem and the second shortest path problem," with Antonio Sedeño-Noda.
November 3, 2018	INFORMS, Phoenix, AZ. "A fast maximum flow algorithm." With Xiaoyue Gong.
April 16, 2018	Texas, A&M. Distinguished lecture series in Industrial and Systems Engineering. "The second shortest path problem and the shortest cycle problem," with Antonio Sedeño-Noda.
February 23, 2018	University of Massachusetts, Amherst. Distinguished lecture series in Operations Research. "The second shortest path problem and the shortest cycle problem."
January, 2017	Symposium on Discrete Algorithms, Barcelona, Spain. "An $O(nm)$ time algorithm for finding a minimum cost cycle in a graph," with Antonio Sedeño-Noda.
November, 2016	INFORMS, Nashville. "Algorithms for stable matching with imperfect transfer of utility" with Rajan Udwani. "Algorithms for cycles in graphs."
June, 2016	INFORMS, Hawaii. "Stable matchings with imperfectly transferrable utilities," with Rajan Udwani.
November, 2015	INFORMS, Phila. Robust Monotone Submodular Function Maximization.

July 16, 2015

ONR Conference. MIT. Faster algorithms for knapsack problems. Joint with Donguk Rhee.