

Anant Balakrishnan

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EDUCATION

- Ph.D., Sloan School of Management, Massachusetts Institute of Technology, Cambridge, 1985
- MBA, Indian Institute of Management, Ahmedabad, 1978
- Bachelor of Technology (Electronics Engineering), Indian Institute of Technology, Madras, 1976

ACADEMIC APPOINTMENTS

- Associate Dean for Research, McCombs School of Business, The University of Texas at Austin (2004–2011)
- Kenneth M. and Susan T. Jastrow II Chair in Business, McCombs School of Business, The University of Texas at Austin (2005–present)
- Red McCombs Endowed Chair in Business, McCombs School of Business, The University of Texas at Austin (2002–05)
- Smeal Chaired Professor of Management Science & Information Systems, Smeal College of Business, The Pennsylvania State University (1996–2002)
- Associate Professor/Assistant Professor, Sloan School of Management, MIT (1988–95)
- Assistant Professor, Krannert Graduate School of Management, Purdue University (1985–88)
- Research Associate, Indian Institute of Management, Ahmedabad (1979–80)

AWARDS

- McCombs School of Business *Career Award for Outstanding Research Contributions*, 2017
- Finalist, INFORMS *Daniel H. Wagner Prize for Excellence in Operations Research Practice*, 2017
- *IIE Transactions Best Paper Award*, Institute of Industrial and Systems Engineers, 2016
- *Wickham Skinner Best Published Paper Award*, Production and Operations Management Society, 2011
- *Best paper award*, Telecommunications Section, INFORMS National Meeting, San Jose, California, 2002
- *Research Fellow*, eBusiness Research Center, Penn State University, 2001–02
- *Salgo Noren Outstanding MBA Teaching Award*, Krannert Graduate School of Management, Purdue University, 1988
- *Transportation Science Best Dissertation Prize*, Operations Research Society of America, 1985
- *Zenon and Clotilde Zannetos Dissertation Prize*, Sloan School of Management, MIT, 1985

- *Institute Gold Medal*, Indian Institute of Management, Ahmedabad, 1978
- *Air India Scholarship*, Indian Institute of Management, Ahmedabad, 1977, 1978

PRIMARY RESEARCH AREAS

- Operations planning and scheduling
- Logistics and distribution management
- Supply chain design and coordination
- Telecommunications network planning and optimization
- Network optimization and integer programming

REFEREED PUBLICATIONS

- Balakrishnan, A., T. L. Magnanti, P. Mirchandani, and R. T. Wong. 2020. "Network Design with Routing Requirements," in *Network Design with Applications to Transportation and Logistics*, T. G. Crainic, M. Gendreau, and B. Gendron, (eds.) Springer 2020
- Roth, B., A. Balakrishnan, P. Dewan, A. Kuo, D. Mallampati, and J. Morales. 2018. "Crew Decision Assist: System for Optimizing Crew Assignments in BNSF Railway," *Interfaces* (now called *INFORMS Journal on Applied Analytics*), Vol. 48, pp. 436-448, 2018
- Balakrishnan, A., G. Li, and P. Mirchandani. 2017. "Optimal Network Design with End-to-End Service Requirements," *Operations Research*, Vol. 65, pp. 729-750.
- Balakrishnan, A., and C. V. Karsten. 2017. "Container Shipping Service Selection and Cargo Routing with Transshipment Limits," *European Journal of Operational Research*, Vol. 263, pp. 652-663.
- Balakrishnan, A., A. Kuo, and X. Si. 2016. "Real-Time Decision Support for Crew Assignment in Double-Ended Districts for Freight Railways," *Transportation Science*, Vol. 50, pp. 1337-1359.
- Li, G., and A. Balakrishnan. 2016. "Models and Algorithms for Network Reduction," *European Journal of Operational Research*, Vol. 248, pp. 930-942.
- Balakrishnan, A., and H. P. Natarajan. 2014. "Designing Fee Tables for Retail Delivery Services by Third-party Logistics Providers," *IIE Transactions*, Vol. 46, pp. 1261-1278. (Winner of *IIE Transactions Best Paper Award*, 2016) (Featured in *Industrial Engineer*, Vol. 46, No. 11, November 2014)
- Balakrishnan A., and H. P. Natarajan. 2014. "Integrated Procurement Planning in Multi-division Firms," *Production and Operations Management*, Vol. 23, pp. 1795-1810.
- Balakrishnan, A., S. Sundaresan, and B. Zhang. 2014. "Browse-and-Switch: Retail-Online Competition under Value Uncertainty," *Production and Operations Management*, Vol. 23, No. 7, pp. 1129-1145.

- Balakrishnan, A., M. Banciu, K. Glowacka, and P. Mirchandani. 2013. "Hierarchical Approach for Survivable Network Design," *European Journal of Operational Research*, Vol. 225, pp. 223-235.
- Akçay, Y., A. Balakrishnan, and S. Xu. 2010. "Dynamic Assignment of Flexible Service Resources," *Production and Operations Management*, Vol. 19, No. 3, pp. 279-304. (Winner of the *Wickham Skinner Best Published Paper Award*, Production and Operations Management Society, 2011)
- Balakrishnan, A., P. Mirchandani, and H. Natarajan. 2009. "Connectivity Upgrade Models for Survivable Network Design," *Operations Research*, Vol. 57, pp. 170-186.
- Balakrishnan, A., P. Mirchandani, and H. Natarajan. 2009. Electronic Companion to "Connectivity Upgrade Models for Survivable Network Design," *Operations Research*, <http://or.journal.informs.org/cgi/data/57/1/170/DC1/1>, 11 pages.
- Balakrishnan, A., M. S. Pangburn, and E. Stavroulaki. 2008. "Integrating the Promotional and Service Roles of Inventories," *Manufacturing & Service Operations Management*, Vol. 10, No. 2, pp. 218-235.
- Balakrishnan, A., M. S. Pangburn, and E. Stavroulaki. 2004. "Stack them high, Let 'em fly: Lot-sizing Policies when Inventories Stimulate Demand," *Management Science*, Vol. 50, No. 5, pp. 630-644.
- Balakrishnan, A., and J. Geunes. 2004. "Collaboration and Coordination in Supply Chain Management and E-Commerce," Introduction, *Production and Operations Management* special issue, Vol. 13, No. 1, pp. 1-2.
- Balakrishnan, A., J. Geunes, and M. S. Pangburn. 2004. "Coordinating Supply Chains by Controlling Upstream Variability Propagation," *Manufacturing & Service Operations Management*, Vol. 6, No. 2, pp. 163-183.
- Akçay, Y., A. Balakrishnan, and S. Xu. 2004. "Scheduling of Flexible Resources in Professional Services Firms," *Handbook on Scheduling: Algorithms, Models, and Performance Analysis*, J. Y-T. Leung (ed.), CRC Press.
- Balakrishnan, A., T. L. Magnanti, and P. Mirchandani. 2004. "Connectivity-Splitting Models for Survivable Network Design," *Networks*, Vol. 43, No. 1, pp. 10-27.
- Rangaswamy, A., N. I. Shaikh, and A. Balakrishnan. 2003. "Small-World Markets and Their Use in Forecasting the Sales of New Products," in *Management of Research and Development in the New Millennium*, Macmillan, pp. 359-366.
- Balakrishnan, A., and J. Geunes. 2003. "Production Planning with Flexible Product Specifications: An Application to Specialty Steel Manufacturing," *Operations Research*, Vol. 51, No. 1, pp. 94-112.
- Rangaswamy, A., and A. Balakrishnan. 2003. "From Many to One: Personalized Product Fulfillment Systems," in *The Power of One: Gaining Business Value from Personalization Technologies*, eBRC Press, pp. 33-57.
- Balakrishnan, A., T. L. Magnanti, J. Sokol, and Y. Wang. 2002. "Spare Capacity Assignment for Line Restoration Using a Single Facility Type," *Operations Research*, Vol. 50, No. 4, pp. 617-635.

- Balakrishnan, A., J. Geunes, and M. S. Pangburn. 2002. "Coordinating the Distribution Chain: New Models for New Challenges," in *Supply Chain Management: Models, Applications, and Research Directions*, Kluwer Academic Publishers, pp. 199-242.
- Balakrishnan, A., T. L. Magnanti, J. Sokol, and Y. Wang. 2001. "Telecommunication Link Restoration Planning with Multiple Facility Types," *Annals of Operations Research*, Vol. 106, pp. 127-154.
- Balakrishnan, A., T. L. Magnanti, and P. Mirchandani. 2001. "Intuitive Solution-Doubling Techniques for Worst-case Analysis of Some Survivable Network Design Problems," *Operations Research Letters*, Vol. 29, No. 3, pp. 99-106.
- Balakrishnan, A., H. P. Natarajan, and M. S. Pangburn. 2000. "Optimizing Delivery Fees for a Network of Distributors," *Manufacturing & Service Operations Management*, Vol. 2, No. 3, pp. 297-316.
- Balakrishnan, A., and J. Geunes. 2000. "Requirements Planning with Substitutions: Exploiting Bill-of-Materials Flexibility in Production Planning," *Manufacturing & Service Operations Management*, Vol. 2, No. 2, pp. 166-185.
- Balakrishnan, A., S. R. T. Kumara, and S. Sundaresan. 1999. "Manufacturing in the Digital Age: Exploiting Information Technologies for Product Realization," *Information Systems Frontiers*, Vol. 1, No. 1, pp. 25-50.
- Balakrishnan, A., and T. Semmelbauer. 1999. "Circuit Diagnosis Support System for Electronics Assembly Operations," *Decision Support Systems*, Vol. 25, pp. 251-269.
- Balakrishnan, A., and F. Vanderbeck. 1999. "A Tactical Planning Model for Mixed-model Electronics Assembly Operations," *Operations Research*, Vol. 47, No. 3, pp. 395-409.
- Balakrishnan, A., T. L. Magnanti, and P. Mirchandani. 1998. "Designing Hierarchical Survivable Networks," *Operations Research*, Vol. 46, No. 1, pp. 116-136.
- Balakrishnan, A., T. L. Magnanti, and P. Mirchandani. 1997. "Network Design," in *Annotated Bibliographies in Combinatorial Optimization*, M. Dell 'Amico, F. Maffioli, and S. Martello (eds.), John Wiley, pp. 311-334.
- Aman, A., A. Balakrishnan, and V. Chandru. 1997. "On-line Maintenance of Optimal Machine Schedules," *Sadhana*, Indian Academy of Sciences, Vol. 22, Part 2, pp. 257-279.
- Balakrishnan, A., and S. Gopalakrishnan. 1996. "Selecting Ingot Sizes for Joint Production of Sheet Products," *INFORMS Journal on Computing*, Vol. 8, No. 3, pp. 260-273.
- Balakrishnan, A., R. L. Francis, and S. J. Grotzinger. 1996. "Bottleneck Resource Allocation in Manufacturing," *Management Science*, Vol. 42, No. 11, pp. 1611-1625.
- Balakrishnan, A., T. L. Magnanti, and P. Mirchandani. 1996. "Heuristics, LPs, and Trees on Trees: Network Design Analyses," *Operations Research*, Vol. 44, No. 3, pp. 478-496.
- Balakrishnan, A., and S. Brown. 1996. "Process Planning for Aluminum Tubes: An Engineering-Operations Perspective," *Operations Research*, Vol. 44, No. 1, pp. 7-20.
- Balakrishnan, A., S. Brown, D. Dunlap, and R. Pahl. 1995. "Interdisciplinary Industry-University Collaboration: Lessons from an Operations Improvement Project," *Interfaces*, Vol. 25, No. 5, pp. 12-41.

- Balakrishnan, A., T. L. Magnanti, and R. T. Wong. 1995. "A Decomposition Algorithm for Local Access Telecommunications Network Expansion," *Operations Research*, Vol. 43, pp. 58-76.
- Balakrishnan, A., R. Kalakota, P. S. Ow, and A. B. Whinston. 1995. "Document-centered Information Systems to Support Reactive Problem-solving in Manufacturing," *International Journal of Production Economics*, Vol. 38, pp. 31-58.
- Balakrishnan, A., T. L. Magnanti, and P. Mirchandani. 1994. "A Dual-based Algorithm for Multi-level Network Design," *Management Science*, Vol. 40, pp. 567-581.
- Balakrishnan, A., R. Kalakota, P. S. Ow, and A. B. Whinston. 1994. "Designing Collaborative Systems to Support Reactive Problem-Solving in Manufacturing," in *Integration: Information and Collaboration Models*, S. Y. Nof (ed.), Kluwer Academic Publishers, pp. 105-133.
- Balakrishnan, A., T. L. Magnanti, and P. Mirchandani. 1994. "Modeling and Heuristic Worst-case Performance Analysis of the Two-level Network Design Problem," *Management Science*, Vol. 40, pp. 846-867.
- Aman, A., A. Balakrishnan, and V. Chandru. 1992. "Dynamic Task Assignment in Distributed Manufacturing Systems," in *New Directions for Operations Research in Manufacturing*, G. Fandel, T. Gullledge and A. Jones (eds.), Springer-Verlag, pp. 249-263.
- Balakrishnan, A., and K. Altinkemer. 1992. "Using a Hop-constrained Model to Generate Alternative Communication Network Designs," *ORSA Journal on Computing*, Vol. 4, No. 2, pp. 192-205.
- Balakrishnan, A., and A. B. Whinston. 1992. "Information Issues in Model Specification," *Information Systems Research*, Vol. 2, No. 4, pp. 263-286.
- Balakrishnan, A., T. L. Magnanti, A. Shulman, and R. T. Wong. 1991. "Models for Planning Capacity Expansion in Local Access Telecommunication Networks," *Annals of Operations Research*, Vol. 33, pp. 239-284.
- Balakrishnan, A., J. C. Moore, R. Pakath, and A. B. Whinston. 1991. "Information Tradeoffs in Model Building: A Network Routing Application," *Comp. Sci. in Econ. and Mgt.*, Vol. 4, pp. 201-227.
- Balakrishnan, A., T. W. Chien, and R. T. Wong. 1990. "Selecting Aircraft Routes for Long-haul Operations: A Formulation and Solution Method," *Transportation Research*, Vol. 24B, No. 1, pp. 57-72.
- Balakrishnan, A., T. L. Magnanti, and R. T. Wong. 1989. "A Dual-Ascent Procedure for Large-scale Uncapacitated Network Design," *Operations Research*, Vol. 37, No. 5, pp. 716-740.
- Balakrishnan, A. 1989. "Preemptive Scheduling of Hybrid Parallel Machines," *Operations Research*, Vol. 37, pp. 301-313.
- Chien, T.W., A. Balakrishnan, A., and R. T. Wong. 1989. "An Integrated Inventory Allocation and Vehicle Routing Problem," *Transportation Science*, Vol. 23, pp. 67-76.
- Balakrishnan, A., and S. C. Graves. 1989. "A Composite Algorithm for a Concave-cost Network Flow Problem," *Networks*, Vol. 19, pp. 175-202.

- Balakrishnan, A., R. D. Plante, and R. T. Wong. 1988. "The Nozzle Guide Vane Problem: Partitioning a Heterogeneous Inventory," *European Journal of Operational Research*, Vol. 35, pp. 328-338.
- Balakrishnan, A. 1987. "LP Extreme Points and Cuts for the Fixed-charge Network Design Problem," *Mathematical Programming*, Vol. 39, pp. 263-284.
- Balakrishnan, A., J. E. Ward, and R. T. Wong. 1987. "Integrated Facility Location and Vehicle Routing Models: Recent Work and Future Prospects," *American Journal of Mathematical and Management Sciences*, Vol. 7, pp. 35-61.
- Balakrishnan, A., and N. R. Patel. 1987. "Problem Reduction Methods and a Tree Generation Algorithm for the Steiner Network Problem," *Networks*, Vol. 17, pp. 65-85.

PROCEEDINGS (since 2000)

- Balakrishnan, P. Mirchandani, and B. Zhang. 2006. "Modeling and Solving Service Network Design Problems" (with P. Mirchandani and B. Zhang), *NSF Design, Service and Manufacturing Grantees and Research Conference Proceedings*, St. Louis, Missouri.
- Balakrishnan, A., Y. Xia, and B. Zhang. 2005. "Shaping Demand to Match Anticipated Supply," Proceedings of the *Manufacturing & Service Operations Management Conference*, Evanston, IL, June 2005
- Balakrishnan, P. Mirchandani, and B. Zhang. 2005. "Valid Inequalities for the Constrained Shortest Path Problem," Refereed proceedings of the *International Network Optimization Conference INOC 2005*, Lisbon, Portugal, March 2005, L. Gouveia and C. Mourao (eds.), pp. B1.24 to B1.30
- Balakrishnan, A., P. Mirchandani, and B. Zhang. 2005. "A Cutting-Plane Approach for the Weight-Constrained Network Design Problem" *2005 NSF Design, Service and Manufacturing Grantees and Research Conference Proceedings*, Scottsdale, Arizona, J. Shah (ed.)
- Balakrishnan, A., P. Mirchandani, and B. Zhang. 2004. "Optimal Routing in Service Networks," *2004 NSF Design, Service and Manufacturing Grantees and Research Conference Proceedings*, Dallas, Texas, R. Kovacevic (ed.)
- Balakrishnan, A., and P. Mirchandani. 2003. "A New Approach for Designing Robust Networks," *2003 NSF Design, Service and Manufacturing Grantees and Research Conference Proceedings*, R. G. Reddy (ed.), pp. 617-646.
- Balakrishnan, A., T. L. Magnanti, and P. Mirchandani. 2002. "Improved Formulations for Survivable Network Design," Proceedings of the *Sixth Annual INFORMS Telecommunications Conference*, Boca Raton, p. 49.
- Balakrishnan, A., M. S. Pangburn, and E. Stavroulaki. 2000. "Lot Sizing with Demand Stimulating Inventories," Proceedings of the *Manufacturing and Service Operations Management Conference*, Ann Arbor, Michigan, July 2000.

RESEARCH FUNDING

Research activities funded by grants from the National Science Foundation, as well as sponsored-research projects with many corporations in the manufacturing, transportation, and telecommunications sectors.

STUDENT SUPERVISION

Served as thesis advisor or co-advisor for over 40 graduate (masters' and doctoral) students in management and engineering at Purdue, MIT, Penn State, and the University of Texas at Austin. Also served on thesis committees for many masters' and doctoral students.

PROFESSIONAL ACTIVITIES

Editorial Service

- Senior Editor, *Productions and Operations Management*, 2003-09, 2015-present
- Editorial Board Member, *Networks*, 1999–present
- Area Editor, *Operations Research*, 2006-2012
- Area Editor, Telecommunications & E-Commerce, *INFORMS Journal on Computing*, 1992–2001
- Senior Editor, Associate Editor, *Manufacturing & Service Operations Management*, 1996-2005, 2010-2015
- Associate Editor, *Management Science*, 2006–2009
- Co-editor, Special issue of *Production and Operations Management* on “Collaboration and Coordination in Supply Chain Management and E-Commerce,” 2002–04
- Editorial Board Member, *Telecommunication Systems*, 1994–2006
- Editorial Board Member, *Technology & Operations Review*, 1996–99

Referee for many journals including:

Management Science, Operations Research, Manufacturing & Service Operations Management, Production and Operations Management, Decision Support Systems, IIE Transactions, Mathematical Programming, Naval Research Logistics, Networks, SIAM Journal of Discrete and Algebraic Methods, Transportation Science, Transportation Research, INFORMS Journal on Computing, Telecommunication Systems, Annals of Operations Research.

Professional Presentations

Regularly present research in invited sessions at leading national and international conferences in operations and supply chain management, operations research, and management science, and have given invited seminars at many universities.

Professional Service

- Member or Chair of several committees for best paper, dissertation, and student paper competitions (including competitions organized by Telecommunications, Manufacturing & Service Operations, Analytics, and Railroad Applications Sections) in INFORMS.
- Member of Program Review team for programs at other universities, including MSIS program at Carey School of Business, Johns Hopkins University, and PhD program at HKUST Business School
- Member of National Science Foundation panels and of Committee of Visitors DMII Division.
- Program Committee member for several conferences including INFORMS Boston and Austin Conferences, International Network Optimization Conference, and TRISTAN conferences.
- Vice-President for Subdivisions, INFORMS, 1999 - 2002

UNIVERSITY SERVICE

- Associate Dean for Research, McCombs School of Business, University of Texas at Austin, 2004 – 2011
- Chair, McCombs Faculty Research Committee (2018-present), McCombs Research Awards Committee (2017-18), and member or chair of many school-wide and departmental committees
- Served as Chair or Member of many school-wide and departmental committees, at Purdue, MIT, Penn State, and the University of Texas at Austin, dealing with strategic planning, doctoral curriculum design, graduate programs review and renewal (Ph.D. and MBA), undergraduate research opportunities, curriculum review and redesign, promotion and tenure, recruiting, research, endowment, centers, and outreach activities.