



Shanghai Institute of Mechanical Engineering	Visiting Professor	July 82-Jan 83
Optiant	Member of Advisory Board	2000 - 2009
Servigistics	Chief Scientist	2001 – 2004
JDA	Chief Science Advisor	2005 - 2011

History of M.I.T. Appointments:

<u>Rank</u>	<u>Beginning</u>	<u>Ending</u>
Assistant Professor, Sloan School of Management	7/77	6/81
Associate Professor, Sloan School of Management	7/81	6/87
Professor, Sloan School of Management	7/87	
Leaders for Manufacturing Professor	7/88	6/93
Deputy Dean	9/90	8/93
Abraham J. Siegel Professor of Management	10/95	
Professor, Engineering Systems Division (joint)	7/99	6/15
Professor, Mechanical Engineering Department (joint)	7/05	
Interim Director, Engineering Systems Division	9/12	12/13

Industrial Consulting Record:

Firm and Dates

Bausch and Lomb, 1976; Shycon Associates, 1980 - 1986; GTE Research Laboratories, 1981 - 1982, 1984, 1986; Illinois Central Gulf Railroad, 1982; C.S. Draper Laboratory, 1982 - 1984; ROLM Corporation, 1984, 1993; Palladian Software, 1986; GM Research Laboratories, 1986 – 1997, 2003 - 2004; W.R. Grace, 1987, 1991; Millipore, 1988; WearGuard, 1988; Alcoa, 1993 – 1994; Amazon.Com, 2001; Invistics, 2002 – 2005; Servigistics, 2001 – 2003; JDA, 2003 – 2011; Honeywell, 2003; FormFactor 2006; McMaster-Carr 2007; Sears Holdings, 2015; New York City, 2017; State of Michigan, 2017; Oniqua 2018; PGATour 2019.

Institute Activities:

Staff Member of Operations Research Center, 1977 - present  
 Undergraduate Advisor, 1978 - present  
 Freshman Advisor, 1991- 1998, 2002 - 2005, 2008 - present  
 Member of Sloan Program Committees: 1978 – 2013 (SB); 1978-1980 (SM); 1985-1987, 1994 – 1998, 2005 - 2008 (PhD).  
 Chair of Sloan Undergraduate Education Committee, 2010 - 2013  
 Member of Committee on Academic Performance, 1984 -1986  
 Member of Committee on Discipline, 1995 – 1997  
 Chair of Committee on Discipline, 1997 – 2001  
 Member of Sloan Dean Search Committee, 1987  
 Member of Freshman Housing Committee, 1989  
 Acting CoDirector, Leaders for Manufacturing Program, 1989 -1990

Chair of Parking and Transportation Committee, 1989 -1995  
Member of Parking and Transportation Committee, 2016 - 2020  
CoDirector, Leaders for Manufacturing Program, 1994 - 2001  
CoDirector, System Design and Management Program, 1999 - 2001  
Chair of Task Force on ROTC, 1995 – 1996  
Chair of Sloan Dean Search Committee, 1998  
Chair of MIT Faculty, 2001 – 2003  
Chair of Faculty Policy Committee, 2001 – 2003  
Member of Task Force on Campus Security, 2001  
Member, ad hoc committee on Access to and Disclosure of Scientific Information, 2002  
Chair, review committee on Faculty Newsletter, 2002  
Faculty Newsletter, Editorial Board, 2003 – 2009  
Member of Faculty Advisory Committee for MIT Presidential Search, 2004 - 2005  
Member of Committee on Undergraduate Admissions and Financial Aid, 2004 – 2006  
Chair of Committee on Undergraduate Admissions and Financial Aid, 2007 – 2008  
Member of ad hoc committee on MIT Disciplinary System, 2005  
Member of ad hoc committee on MLK Visiting Professor Program, 2006  
Member of Stellar faculty advisory committee, 2004 – 2010  
Chair of Search Committee for Dean of Graduate Student Office, 2007  
Chair of Dean for Graduate Education Search Advisory Committee, 2010  
Chair of Committee on Graduate Policy, 2008 – 2011  
Member of Commencement Committee, 2007 – 2011, 2018 – 2019  
Member of Search Committee for Director of Student Financial Services, 2008- 2009  
Chair of Search Committee for Director of Financial Aid, 2009 – 2010  
Member of MIT150 Steering Committee, 2008 – 2011  
Chair of ad hoc committee: Strategic Review of MIT Sloan’s Undergraduate Programs, 2009  
Member of Education Working Group of the MIT Planning Task Force, 2009  
Member of NGS3 faculty advisory group, 2009- 2011  
Member of Independent Activities Period (IAP) Subcommittee of the FPC, 2012  
Member of Committee on the Undergraduate Program, 2011 – 2013  
Chair of Committee on the Undergraduate Program, 2013 - 2014  
Co-chair of Task Force for Graduate Student Professional Development, 2012 – 2013  
Member of ROTC Oversight Committee, 2012-2014  
Member of Employee Assistance Program (EAP) Advisory Committee, 2015 - 2020  
Member of ad hoc Group on the Future of Libraries, 2015 – 2016  
Member of Committee on Campus Planning, 2016 – 2017  
Chair of Committee on Campus Planning, 2017 - 2018  
Member of Committee on Community Giving, 2016 – 2020  
Member of ad hoc Committee of Graduate Housing, 2017 – 2019  
Member of DAPER Advisory Board, 2017 – 2020  
Graduate Officer, IDSS, 2017 - 2020  
Member of Educational Effectiveness planning group, MIT Accreditation, 2018 – 2019  
Member of Committee on Student Life, 2018 – 2020  
Member of Search Committee for Athletic Director, 2019  
Member of Graduate Housing transition team, 2019

### Professional Activities:

Associate Editor - *Operations Research*, 1981-1986; *Management Science*, 1983-1986, 2001 - 2003; *Manufacturing & Service Operations Management*, 1997 – 2008, 2015 - 2017  
Department Editor - *Management Science*, 1987-1991  
Area Editor – *Operations Research*, 2006 – 2008  
Editor - *Manufacturing & Service Operations Management*, 2009 - 2014  
Functional Area Editor - *Interfaces*, 1985-1986  
Editor, Edelman Special Issue, *Interfaces*, 1989 - 2007  
Member - INFORMS  
Member of Student Affairs Committee for ORSA, 1980-1983  
Edelman Award Committee, 1988 – 2007; 2011 & 2012 (Chair)  
INFORMS (formerly TIMS/ORSA) Publication Committee, 1990-1998, 2006 - 2008  
Vice President, Publications - INFORMS, 1994 – 1995  
President Elect, INFORMS 2020

### Awards:

Fellow of the Manufacturing and Service Operations Management Society  
Fellow of the Production and Operations Management Society  
INFORMS Fellow  
1999 Billard Award for service at MIT  
2012 MSOM Distinguished Service Award  
Zaragoza Logistics Center: Medal of Distinction (2013)  
INFORMS Case Competition, First Prize (2005)  
M&SOM Best Paper Award (2017)  
Member of National Academy of Engineering

### Subjects Taught:

15.062 Decision Models for Management  
15.761 Operations Management  
15.763 Practice of Operations Management  
15.764 Theory of Operations Management  
15.053 Introduction to Management Science  
15.770J Transportation and Logistics Analysis  
15.066J System Optimization and Analysis for Manufacturing  
15.762 Operations Management: Models and Applications  
15.762J Supply Chain Planning  
15.763J Manufacturing Systems and Supply Chain Design  
15.A03 Operations Research Can be Fun (freshmen seminar)  
EC.733J D Lab Supply Chains (15.772J)  
15.762x Supply Chains for Manufacturing I (MITx)  
15.763x Supply Chains for Manufacturing II (MITx)

## Publications:

### Books

1. Handbook in Operations Research and Management Science, Volume 4: Logistics of Production and Inventory, edited by S. C. Graves, A. H. G. Rinnooy Kan and P. H. Zipkin, North-Holland, Amsterdam, 1993.
2. Handbook in Operations Research and Management Science, Volume 11: Supply Chain Management: Design, Coordination and Operation, edited by A. G. De Kok and S. C. Graves, Elsevier, Amsterdam, 2003.

### Papers

3. Optimal Storage Assignment in Automatic Warehousing Systems, (with W.H. Hausman and L.B. Schwarz), *Management Science*, February 1976, Vol. 22, 629-638.
4. Single Cycle Continuous Review Policies for Arborescent Production/Inventory Systems, (with L.B. Schwarz), *Management Science*, January 1977, Vol. 23, 529-540.
5. Storage-Retrieval Interleaving in Automatic Warehousing Systems, (with W.H. Hausman and L.B. Schwarz), *Management Science*, May 1977, Vol. 23, 935-945.
6. A Note on 'Critical Ratio Scheduling: An Experimental Analysis', *Management Science*, August 1977, Vol. 23, 1358-1359.
7. On 'Production Runs for Multiple Products: The Two-Product Heuristic', (with R.W. Haessler), *Management Science*, July 1978, Vol. 24, 1194-1196.
8. Scheduling Policies for Automatic Warehousing Systems: Simulation Results, (with W.H. Hausman and L.B. Schwarz), *AIE Transactions*, September 1978, Vol. 10, 260-270.
9. A Note on the Deterministic Demand Multi-Product Single-Machine Lot Scheduling Problem, *Management Science*, March 1979, Vol. 25, 276-280.
10. A Methodology for Studying the Dynamics of Extended Logistics Systems, (with J. Keilson), *Naval Research Logistics Quarterly*, July 1979, Vol. 26, 169-197.
11. An n-Constraint Formulation of the (Time Dependent) Traveling Salesman Problem, (with K.R. Fox and B. Gavish), *Operations Research*, July-August 1980, Vol. 28, 1018-1021.
12. The Multi-Product Production Cycling Problem, *AIE Transactions*, September 1980, Vol. 12, 233-240.
13. A One-Product Production/Inventory Problem with Continuous Review Policy, (with B. Gavish), *Operations Research*, September-October 1980, Vol. 28, 1228-1236.

14. Production/Inventory Systems with a Stochastic Production Rate Under a Continuous Review Policy, (with B. Gavish), *Computers and Operations Research*, 1981, Vol. 8, 169-183.
15. Multistage Lot-Sizing: An Iterative Procedure, in *TIMS Studies in Management Science, Multi-Level Production/Inventory Systems: Theory and Practice*, edited by L.B. Schwarz, 1981, Vol. 16, 95-109.
16. The Compensation Method Applied to a One-Product Production Inventory Model, (with J. Keilson), *Mathematics of Operations Research*, May 1981, Vol. 6, 246-262.
17. A Review of Production Scheduling, *Operations Research*, July-August 1981, Vol. 29, 646-675.
18. Problem Formulations and Numerical Analysis in Integer Programming and Combinatorial Optimization, (with J.F. Shapiro), in *Mathematical Programming with Data Perturbations I*, edited by A.V. Fiacco, 1982, 131-148.
19. Using Lagrangean Techniques to Solve Hierarchical Production Planning Problems, *Management Science*, March 1982, Vol. 28, 260-275.
20. The Application of Queueing Theory to Continuous Perishable Inventory Systems, *Management Science*, April 1982, Vol. 28, 400-406.
21. A Multiple-Item Inventory Model with a Job Completion Criterion, *Management Science*, November 1982, Vol. 28, 1134-1137.
22. System Balance for Extended Logistic Systems, (with J. Keilson), *Operations Research*, March-April 1983, Vol. 31, 234-252.
23. An Integer Programming Procedure for Assembly System Design Problem, (with B. Lamar), *Operations Research*, May-June 1983, Vol. 31, 522-545.
24. Scheduling of Re-entrant Flow Shops, (with H.C. Meal, D. Stefek, and A.H. Zeghmi), *Journal of Operations Management*, August 1983, Vol. 3, 197-207.
25. A Simple Stochastic Model for Facility Planning in a Mental Health Care System, (with H.S. Leff, J. Natkins, and M. Senger), *Interfaces*, October 1983, Vol. 13, 101-110.
26. Deep-Draft Dredging of U.S. Coal Ports: A Cost-Benefit Analysis, (with M. Horwitch and E.H. Bowman), *Policy Sciences*, Vol. 17, 1984.
27. A Study of Production Smoothing in a Job Shop Environment, (with A.B. Cruickshanks and R.D. Drescher), *Management Science*, March 1984, Vol. 30, 368-380.
28. A Minimum Concave-Cost Dynamic Network Flow Problem with an Application to Lot-Sizing, (with J.B. Orlin), *Networks*, Vol. 15, 1985.

29. Description and Field Test of a Mental Health System Resource Allocation Model, (with H.S. Leff, J. Natkins, and J. Bryan), *Administration in Mental Health*, Fall 1985, Vol. 13, 43-68.
30. Continuous-Review Policies for a Multi-Echelon Inventory Problem with Stochastic Demand, (with M. DeBodt), *Management Science*, October 1985, Vol. 31, 1286-1299.
31. A Multi-Echelon Inventory Model for a Repairable Item with One-for-One Replenishment, *Management Science*, October 1985, Vol. 31, 1247-1256.
32. An LP Planning Model for a Mental Health Community Support System, (with H.S. Leff and M. Dada), *Management Science*, February 1986, Vol. 32, 139-155.
33. Overlapping Operations in Material Requirements Planning, (with M.M. Kostreva) *Journal of Operations Management*, Vol. 6, No. 3, May 1986, 283-294.
34. Two-Stage Production Planning in a Dynamic Environment, (with H.C. Meal, S. Dasu, Y. Qiu), in Lecture Notes in Economics and Mathematical Systems, *Multi-Stage Production Planning and Inventory Control*, edited by S. Axsater, Ch. Schneeweiss, and E. Silver, Springer-Verlag, Berlin, 1986, Vol. 266, 9-43.
35. A Tactical Planning Model for a Job Shop, *Operations Research*, July-August 1986, Vol. 34, 522-533.
36. Equipment Selection and Task Assignment for Multiproduct Assembly System Design, (with C.A. Holmes Redfield) *International Journal of Flexible Manufacturing Systems*, 1988, Vol. 1, No. 1, pp. 31-50.
37. Safety Stocks in Manufacturing Systems, *Journal of Manufacturing and Operations Management*, 1988, Vol. 1, No. 1, pp. 67-101.
38. Determining the Spares and Staffing Level for a Repair Depot, *Journal of Manufacturing and Operations Management*, 1988, Vol. 1, No. 2, pp. 227-241.
39. A Composite Algorithm for the Concave-Cost Network Flow Problem, (with A. Balakrishnan) *Networks*, Vol. 19, 1989, pp. 175-202.
40. A Tactical Planning Model for Manufacturing Subcomponents of Mainframe Computers, (with C. Fine), *Journal of Manufacturing and Operations Management*, 1989, Vol. 2, No. 1, pp. 4-34.
41. A Model for the Configuration of Incoming WATS Lines, (with R. H. Blake and P. C. Santos), *Queueing Systems*, 1990, Vol. 7, No. 1, pp. 3-21.
42. Principles on the Benefits of Manufacturing Process Flexibility, (with W. C. Jordan), *Management Science*, April 1995, Vol. 41, No. 4, pp. 577 - 594.

43. A Multi-Echelon Inventory Model with Fixed Replenishment Intervals, *Management Science*, January 1996, Vol. 42, No. 1, pp. 1-18.
44. Cyclic Scheduling in a Stochastic Environment, (with H. Zhang), *Operations Research*, November-December 1997, Vol. 45, No. 6, pp. 894-903.
45. A Dynamic Model for Requirements Planning with Application to Supply Chain Optimization, (with D. B. Kletter and W. B. Hetzel) *Operations Research*, May-June 1998, Vol. 46, Supp. No. 3, pp. S35-S49.
46. OMAC: A System for Operations Modeling and Analysis, (with K. N. McKay and D. B. Kletter), *Annals of OR*, Vol. 72, 1997, pp. 241-264.
47. Reducing Flow Time in Aircraft Manufacturing, (with Jackson Chao), *Production and Operations Management*, Spring 1998, Vol. 7, No. 1, pp. 38-52.
48. A Single-Item Inventory Model for a Non-Stationary Demand Process, *Manufacturing & Service Operations Management*, 1999, Vol. 1, No. 1, pp. 50-61.
49. Optimizing Strategic Safety Stock Placement in Supply Chains, (with S. P. Willems), *Manufacturing & Service Operations Management*, 2000, Vol. 2, No. 1, pp. 68 – 83.
50. Manufacturing Planning and Control, in Handbook of Applied Optimization, edited by P. Pardalos and M. Resende, Oxford University Press, New York, 2002, pp. 728 - 746.
51. Technology Portfolio Management: Optimizing Interdependent Projects over Multiple Time Periods, (with M. Dickinson and A. Thornton), *IEEE Transactions on Engineering Management*, Vol. 48, No. 4, November 2001, pp. 518-527.
52. Creating an Inventory Hedge for Markov-Modulated Poisson Demand: Application and Model, (with H. S. Abhyankar), *Manufacturing & Service Operations Management*, Fall 2001, Vol. 3, No. 4, pp. 306 - 320.
53. Process Flexibility in Supply Chains, (with B. T. Tomlin), *Management Science*, July 2003, Volume 49, Number 7, pp. 907 - 919.
54. Supply Chain Design: Safety Stock Placement and Supply Chain Configuration, (with S. Willems), Chapter 3 in Handbook in Operations Research and Management Science, Volume 11: Supply Chain Management: Design, Coordination and Operation, edited by A. G. De Kok and S. C. Graves, Elsevier, Amsterdam, 2003, pp. 95 - 132.
55. Optimizing the Supply-Chain Configuration for New Products, (with S. Willems), *Management Science*, August 2005, Vol. 51, No. 8, pp. 1165 – 1180.



56. Logistics Network Design with Supplier Consolidation Hubs and Multiple Shipment Options, (with M.L.F. Cheong, R. Bhatnagar), *Journal of Industrial and Management Optimization*, Volume 3, Number 1, February 2007, pp. 51–69.
57. A Single-Product Inventory Model for Multiple Demand Classes, (with H. Arslan, T. Roemer) *Management Science*, September 2007, Vol. 53, No. 9, pp. 1486 – 1500.
58. Flexibility Principles, Chapter 3 in Building Intuition: Insights from Basic Operations Management Models and Principles, edited by D. Chhajed and T. J. Lowe, Springer Science+Business Media, LLC, New York, 2008, pp. 33 – 49.
59. Little’s Law, (with J. D. C. Little), Chapter 5 in Building Intuition: Insights from Basic Operations Management Models and Principles, edited by D. Chhajed and T. J. Lowe, Springer Science+Business Media, LLC, New York, 2008, pp. 81 – 100.
60. Strategic Inventory Placement in Supply Chains: Non-Stationary Demand, (with S. Willems) *Manufacturing & Service Operations Management*, Spring 2008, Vol. 10, No. 2, pp. 278 – 287.
61. The Benefits of Re-Evaluating Real-Time Order Fulfillment Decisions, (with P. Xu and R. Allgor), *Manufacturing & Service Operations Management*, Spring 2009, Vol. 11, No. 2, pp 340-355.
62. Strategic Safety Stocks in Supply Chains with Evolving Forecasts, (with Tor Schoenmeyr) *Manufacturing & Service Operations Management*, Fall 2009, Vol. 11, No. 4, pp 657-673.
63. Optimal Planning Quantities for Product Transition, (with Hongmin Li and Donald Rosenfield), *Production and Operations Management*, March-April 2010, Vol. 19, No. 2, pp 142 – 155.
64. Uncertainty and Production Planning, in Production and Inventories in the Extended Enterprise, edited by Karl G. Kempf, Pinar Keskinocak, and Reha Uzsoy, *International Series in Operations Research & Management Science* Volume 151, Springer US, 2011, pp 83 – 101.
65. Setting Planned Lead Times for a Make-To-Order Production System under Master Schedule Smoothing, (with C. C. Teo and R. Bhatnagar), *IIE Transaction*, 2011, Vol. 43, No. 6, pp. 399-414.
66. How to Catch a Tiger: Understanding Putting Performance on the PGA Tour, (with Douglas Fearing and Jason Acimovic), *Journal of Quantitative Analysis in Sports*, 2011, Vol. 7: Issue 1, Article 5. DOI: 10.2202/1559-0410.1268.
67. Pricing Decisions during Inter-generational Product Transitions, (with Hongmin Li) *Production and Operations Management*, January-February 2012, Vol. 21, No. 1, pp 14-28.

68. Remanufacturing and Energy Savings, (with T. Gutowski, S. Sahni, and A. Boustani), *Environmental Science & Technology*, 2011, Vol. 45, pp. 4540-4547.
69. An Application of Master Schedule Smoothing and Planned Lead Time Control, (with C. C. Teo and R. Bhatnagar), *Production and Operations Management*, March-April 2012, Vol. 21, No. 2, pp 211 - 223.
70. Ship-Pack Optimization in a Two-Echelon Distribution System, (with Naijun Wen and Justin Ren), *European Journal of Operational Research*, August 2012, Vol. 220, Issue 3, pp. 777-785.
71. Optimal Capacity Conversion for Product Transitions under High Service Requirements, (with Hongmin Li and Woonghee Tim Huh), *Manufacturing & Service Operations Management*, Winter 2014, Vol. 16, No. 1, pp. 46-60.
72. A Forecast-driven Tactical Planning Model for a Serial Manufacturing Systems, (with Pallav Chhaochhria) *International Journal of Production Research*, December 2013, 51:23-24, pp. 6860-6879.
73. Water Desalination Supply Chain Modeling and Optimization: The Case of Saudi Arabia, (with Malak T. Al-Nory) *IDA Journal of Desalination and Water Reuse*, Vol. 5, No. 2 (2013) pp 64 - 74.
74. Supply Chain Design for the Global Expansion of Manufacturing Capacity in Emerging Markets, (with Stefan Weiler, Dayán Páez, Jung-Hoon Chun, Gisela Lanza), *CIRP Journal of Manufacturing Science and Technology*, Vol. 4, No. 3 (265-280), 2011.
75. A Network Flow Approach for Tactical Resource Planning in Outpatient Clinics, (with Thu Ba T. Nguyen, Appa Iyer Sivakumar), *Health Care Management Science*, Vol. 18, No. 2 (2015): pp.124-136.
76. Desalination Supply Chain Decision Analysis and Optimization, (with Malak T. Al-Nory, Alexander Brodsky, Burçin Bozkaya), *Desalination* Vol. 347 (2014), pp. 144-157.
77. Making Better Fulfillment Decisions on the Fly in and Online Retail Environment, (with J. Acimovic), *Manufacturing & Service Operations Management*, Winter 2015, Vol. 17, No. 1, pp 34-51.
78. Setting Optimal Production Lot Sizes and Planned Lead Times in a Job Shop System, (with Rong Yuan), *International Journal of Production Research*, (2016), Vol. 54, Issue 20, pp 6105 - 6120. DOI: [10.1080/00207543.2015.1073859](https://doi.org/10.1080/00207543.2015.1073859).
79. OM Forum - Practice-Based Research in Operations Management: What It Is, Why Do It, Related Challenges, and How to Overcome Them, (with Jeremie Gallien and Alan Scheller-Wolf) *Manufacturing & Service Operations Management*, Winter 2016, Vol. 18, No. 1, pp 5 - 14. <http://dx.doi.org/10.1287/msom.2015.0566>

80. Strategic Safety Stock Placement in Supply Chains with Capacity Constraints (with Tor Schoenmeyr) *Manufacturing & Service Operations Management*, Summer 2016, Vol. 18, No. 3, pp 445 - 460. <http://dx.doi.org/10.1287/msom.2016.0577>.
81. [Inventory Management in a Consumer Electronics Closed-Loop Supply Chain](https://doi.org/10.1287/msom.2017.0622), (with Andre Calmon), *Manufacturing & Service Operations Management*, Fall 2017, Vol. 19, No. 4, pp 568 - 585. <https://doi.org/10.1287/msom.2017.0622>
82. Scheduling Rules to Achieve Lead-time Targets in Outpatient Appointment Systems, (with Thu Ba T. Nguyen, Appa Iyer Sivakumar), *Health Care Management Science*, December 2017, Vol. 20, No. 4, pp 578-589. <http://dx.doi.org/10.1007/s10729-016-9374-2>.
83. No Magic Bullet: A Theory-based Meta-analysis of Markov Transition Probabilities in Studies of Service Systems for Persons with Serious Mental Illness, (with H. Stephen Leff, Clifton Chow) *Psychiatric Services* (2017), Vol. 68, No. 3, pp 278-287, <http://dx.doi.org/10.1176/appi.ps.201500523>.
84. Mitigating Spillover in Online Retailing via Replenishment, (with J. Acimovic), *Manufacturing & Service Operations Management*, Summer 2017, Vol. 19, No. 3 pp. 419-436. <https://doi.org/10.1287/msom.2016.0614> . Available at <https://ssrn.com/abstract=2459097>.
85. Stowage Decisions in Multi-zone Storage Systems, (with Rong Yuan and Tolga Cezik), *International Journal of Production Research* (2018) Vol. 56, No. 1-2, pp 333-343. <https://doi.org/10.1080/00207543.2017.1398428> Available at SSRN: <https://ssrn.com/abstract=2990432>
86. Performance Evaluation of Material Separation in a Material Recovery Facility using a Network Flow Model, (with Karine Ip, Mariapaola Testa, Anne Raymond and Timothy Gutowski), *Resources, Conservation and Recycling* 131 (2018): 192-205
87. Capacity Planning with Demand Uncertainty for Outpatient Clinics, (with Thu Ba T. Nguyen, Appa Iyer Sivakumar), *European Journal of Operational Research* 267, no. 1 (2018): 338-348.
88. Velocity-based Storage Assignment in Semi-automated Storage Systems, (with Rong Yuan and Tolga Cezik), *Production and Operations Management* (2019), Vol. 28, No. 2, Feb. 2019, pp. 354 – 373. <https://doi.org/10.1111/poms.12925> Available at: SSRN: <https://ssrn.com/abstract=2889354>.
89. Integrated Planning for Design and Production in Two-Stage Recycling Operations, (with Jiyou C. Chang, Randolph E. Kirchain and Elsa A. Olivetti.) *European Journal of Operational Research*, Vol. 273, no. 2 (2019): 535-547. <https://doi.org/10.1016/j.ejor.2018.08.022>

90. Item Aggregation and Column Generation for Online-Retail Inventory Placement, (with Annie. I. Chen) *Manufacturing & Service Operations Management*. Forthcoming  
[https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=3464278](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3464278)

### Proceedings

1. A Mathematical Programming Procedure for Equipment Selection and System Evaluation in Programmable Assembly, (with D.E. Whitney), *Proceedings of the 18th IEEE Conference on Decision and Control*, Fort Lauderdale, Florida, December 1979, 531-536.
2. Extensions to a Tactical Planning Model for a Job Shop, *Proceedings of the 27th IEEE Conference on Decision and Control*, Austin, Texas, December 1988, pp. 1850-1855.
3. Using Simulated Annealing to Select Least-Cost Assembly Sequences, (with J. M. Milner and D. E. Whitney), *Proceedings of IEEE Conference on Robotics and Automation*, May 1994.
4. Spatial Yield Modeling for Semiconductor Wafers, (with A. I. Mirza, G. O' Donoghue, and A. W. Drake), *Proceedings of IEEE/SEMI Advanced Semiconductor Manufacturing Conference*, November 1995
5. Strategic Safety Stock Placement in Supply Chains, (with S. Willems) *Proceedings of the 1996 MSOM Conference*, Dartmouth College, Hanover NH, June 1996, pp. 299 - 304.
6. Optimizing Monsanto's Supply Chain under Uncertain Demand, (with C. Gutierrez, M. Pulwer, H. Sidhu and G. Weihs), *Annual Conference Proceedings - Council of Logistics Management*, Orlando FL, October 1996, pp. 501-516.
7. Optimizing the Supply-Chain Configuration for New Products, (with S. P. Willems), *Proceedings of the 2000 MSOM Conference*, Ann Arbor, MI, 2000, 8 pp.
8. Tactical Shipping and Scheduling at Polaroid with Dual Lead-Times, (with Kermit Threatte), *Proceedings of the 2002 SMA Conference*, Singapore, 2002, 8 pp.
9. A Base Stock Inventory Model for a Remanufacturable Product, *Proceedings of the 2003 SMA Conference*, Singapore, 2003, 7 pp.
10. Optimizing Safety Stock Placement in General Network Supply Chains, (with K. Lesnaia), *Proceedings of the 2004 SMA Conference*, Singapore, 2004, 7 pp.
11. Traditional Inventory Models in an E-Retailing Setting: A Two-Stage Serial System with Space Constraints, (with R. Allgor and P. Xu), *Proceedings of 2004 SMA Conference*, Singapore, 2004, 6 pp.
12. Logistics Network Design with Differentiated Delivery Lead-Time: Benefits and Insights, (with M.L.F. Cheong, and R. Bhatnagar), *Proceedings of 2005 SMA Conference*, Singapore, 20 pp.

13. An Extension to the Tactical Planning Model for a Job Shop: Continuous-Time Control, (with C. C. Teo, and R. Bhatnagar), *Proceedings of 2005 SMA Conference*, Singapore, 8 pp.
14. The Complexity of Safety Stock Placement in General-Network Supply Chains, (with K. Lesnaia, and I. Vasilescu), *Proceedings of the 2005 SMA Conference*, Singapore, 5 pp.
15. The Benefits of Re-Evaluating Real Time Fulfillment Decisions, (with P. Xu and R. Allgor), *Proceedings of 2005 SMA Conference*, Singapore, 7 pp.
16. Performance Analysis of Order Fulfillment for Low Demand Items in E-tailing, (with P. Chhaochhria), *Proceedings of 2007 SMA Conference*, Singapore, 5 pp.
17. Capacity Planning in a General Supply Chain with Multiple Contract Types, (with X. Huang), *Proceedings of 2007 SMA Conference*, Singapore, 6 pp.
18. Reusing Personal Computer Devices – Good or Bad for the Environment?, (with S. Sahni, A. Boustani and T. Gutowski) IEEE/International Symposium on Sustainable Systems and Technology, Washington D.C, 2010
19. Appliance Remanufacturing and Life Cycle Energy and Economic Savings, (with S. Sahni, A. Boustani and T. Gutowski) IEEE/International Symposium on Sustainable Systems and Technology, Washington D.C, 2010.
20. Water Desalination Supply Chain Modeling and Optimization, (with Malak T. Al-Nory), Data Engineering Workshops (ICDEW), 2013 IEEE 29th International Conference, April 2013.

#### Working Papers and Technical Reports

- W1. The Travelling Salesman Problem and Related Problems, (with B. Gavish), Operations Research Center, M.I.T., Working Paper No. 078-78, July 1978, revised and retitled, March 1981.
- W2. A Research Agenda for Models to Plan and Schedule Manufacturing Systems, (with C. Abraham, B. Dietrich, W. Maxwell, and C. Yano), Sloan School of Management, M.I.T., Working Paper No. 1689-85, revised July 1985.
- W3. Principles on the Benefits of Manufacturing Process Flexibility, (with W. C. Jordan), Sloan School of Management, M.I.T. Working Paper No. 3296-91-MSA, May 1991 (GM Research Laboratories Research Publication GMR-7310).
- W4. An Analytic Approach for Demonstrating the Benefits of Limited Flexibility, (with W. C. Jordan), Sloan School of Management, M.I.T. Working Paper No. 3297-91-MSA, May 1991 (GM Research Laboratories Research Publication GMR-7341).

- W5. [Creating an Inventory Hedge for Markov-Modulated Poisson Demand: Application and Model](#), (with H. S. Abhyankar), January 2000, long version. (short version published in M&SOM).
- W6. [Optimizing Strategic Safety Stock Placement in Supply Chains](#), (with S. Willems), August 1998, long version. (short version published in M&SOM).
- W7. [Strategic Inventory Placement in Supply Chains: Nonstationary Demand](#), (with S. Willems), August 2002 working paper (substantially revised version published in M&SOM).
- W8. [A Constant-Inventory Tactical Planning Model for a Job Shop](#), (with J. S. Hollywood), working paper, January 2001, revised March 2004, January 2006, 36 pp.
- W9. [A Dual-Channel Vendor-Buyer System with Minimum Purchase Commitment](#), with (Y. Wang and R. Bhatnagar), working paper, June 2008, 33 pp.
- W10. [Capacity Planning in a General Supply Chain with Multiple Contract Types – Single Period Model](#), (with Xin Huang), June 2008, revised September 2008, 41 pp
- W11. Ship-pack Optimization in a Two-echelon Distribution System with Product Obsolescence, (with Elnaz Karimi and Z. Justin Ren). *Available at SSRN 3242756* (2018).
- W12. Coordination of Multi-Echelon Supply Chains Using the Guaranteed Service Framework, (with Tor Schoenmeyr). *Available at SSRN 3243806* (2018).
- W13. Warranty Matching in a Consumer Electronics Closed-Loop Supply Chain, (with Andre P. Calmon and Stef Lemmens). *Available at SSRN 3357683* (2019).

### Teaching Cases

1. Steel Works, Inc, prepared by David Kletter, 1996
2. Meditech Surgical, prepared by Bryan Gilpin, 1995.
3. Apollo Paper Company, prepared by Charles DeWitt, 1995.
4. Use of a Queuing Model to Design a Lean System, prepared by Jamie Flinchbaugh, 2002
5. The Challenge at Instron, prepared by Dan Wheeler, 2000.
6. H. C. Starck, Inc., prepared by Thomas J. Carroll, 2000.
7. Ford Pan-European Durable Containers, prepared by Carmelo Anthony Palumbo, 2002.
8. Reebok NFL Replica Jerseys: A Case for Postponement, prepared by John C. W. Parsons, 2005.

9. American Axle and Manufacturing: Determining the Optimal Number of Bar Lengths for Axle Shaft Production, prepared by Heath Holtz, 2005.
10. Production Planning for Chemical Manufacturing, prepared by Shardul Phadnis, 2007.

Invited Presentations (Partial List up to 1992):

1. "Improved Scheduling for Automatic Warehousing Systems: Simulation Tests," (with W.H. Hausman and L.B. Schwarz), Joint ORSA/TIMS National Meeting, New York, New York, May 1978.
2. "Logistic Failure vs. Mission Failure in Reliability Specifications," (with J. Keilson), Department of Defense Acquisition Research Symposium, Hershey, Pennsylvania, June 1978.
3. "A Methodology for Studying the Dynamics of Extended Logistics Systems," (with J. Keilson), Conference on Multi-Echelon Inventory Systems, George Washington University, November 1978.
4. "Multistage Lot-Sizing: An Iterative Procedure," Joint ORSA/TIMS Meeting, New Orleans, May 1979 (Also Purdue, April 1979).
5. "The Introduction of Feedback into a Hierarchical Production Planning System," TIMS XXIV International Meeting, Honolulu, June 1979.
6. "Production Scheduling: Theory and Practice," TIMS XXIV International Meeting, Honolulu, June 1979.
7. "System Balance for Extended Logistics Systems," (with J. Keilson), Conference on Multi-Echelon Inventory Systems, Philadelphia, Pennsylvania, November 1979.
8. "Base Stock Systems for Multistage Planning," Conference on Multi-Echelon Inventory Systems, Chapel Hill, North Carolina, June 1980.
9. "Optimization-Based Approaches to Vehicle Routing Problems," (with T.L. Magnanti), Joint ORSA/TIMS National Meeting, Colorado Springs, Colorado, November 1980.
10. "A Mathematical Programming Heuristic for Manufacturing System Design and Evaluation," (with B.W. Lamar) CORS/TIMS/ORSA National Meeting, Toronto, May 1981.
11. "The Dynamics of a Multiechelon Inventory System for a Repairable Item," (with J. Keilson), ORSA/TIMS National Meeting, Houston, October 1981.
12. "A Study of Production Smoothing in a Job Shop," (with A.B. Cruickshanks and R.D. Drescher), TIMS/ORSA National Meeting, Detroit, April 1982.

13. "Scheduling of Re-entrant Flow Shops," (with H.C. Meal, D. Stefek, A.H. Zeghmi), TIMS/ORSA National Meeting, Chicago, May 1983.
14. "An LP Planning Model for a Mental Health Community Support System," (with M. Dada and H.S. Leff), ORSA/TIMS National Meeting, Orlando, November 1983.
15. "Operational Analysis of a Job Shop," TIMS/ORSA National Meeting, San Francisco, May 1984.
16. "Two-Stage Production Planning in a Dynamic Environment," (with H.C. Meal), ORSA/TIMS National Meeting, Dallas, November 1984.
17. "Determining the Spares and Staffing Levels for a Repair Depot," TIMS/ORSA National Meeting, Boston, May 1985.
18. "Developing and Use of a Production Flow Plan," ORSA/TIMS National Meeting, Atlanta, November 1985.
19. "Safety Stocks in Manufacturing Systems," ORSA/TIMS National Meeting, Miami, October 1986.
20. "Equipment Selection and Task Assignment for Multiproduct Assembly System Design," (with C.A. Holmes), ORSA/TIMS National Meeting, St. Louis, October 1987.
21. "A Multiechelon Inventory Model for Fixed Reorder Intervals," TIMS/ORSA National Meeting, Washington, DC, April 1988.
22. "Production Planning in a Dynamic Environment," ORSA/TIMS National Meeting, Denver, October 1988. (Also, Yale, November 1988, Carnegie-Mellon, April 1989.)
23. "Cyclic Schedules in Stochastic Environments," CORS/TIMS/ORSA National Meeting, Vancouver, Canada, May 1989.
24. "Production Planning over a Multiplant Operation," ORSA/TIMS National Meeting, Philadelphia, October 1990.
25. "Principles on the Benefits of Manufacturing Flexibility," (with W. C. Jordan), TIMS/ORSA National Meeting, Nashville, May 1991. (Also, University of Minnesota, February 1991, Ohio State, November 1991).
26. "Some Thoughts on Inventory Modeling and Diagnostics," UCLA Conference in Honor of El Buffa, Los Angeles, November 1991.
27. "Reducing Flow Time in Aircraft Manufacturing," (with Jackson Chao), ORSA/TIMS National Meeting, San Francisco, October 1992.



Thesis Supervision (Partial List):

- R. Blake, Allocation of Items under Fixed Capacity, S.M., June 1978 (reader).
- M. Pendrock, A Hierarchical Approach to Integrated Production and Distribution Planning, S.M. June 1978 (reader).
- A. Dutra, The Impact of Multiple Objectives on Strategic Decision Making: A Case Analysis of the *Sloan Management Review*, S.M., June 1979.
- N. Zarin, A Mathematical Model of the Deinstitutionalization of the Cambridge-Somerville Mental Health Region, S.M., June 1979.
- M. Cross, Business Planning for Small Manufacturing Companies, S.M., June 1980.
- B. Lamar, Optimal Machine Selection and Task Assignment in an Assembly System Design Problem, S.M., September 1980.
- M. Ibrahim, Modeling and Analysis of Automated Manufacturing Systems with Focus on Equivalence and Computational Complexity, S.M., May 1981.
- M. Neel, A Contract Engineering Model, A Work Force Management Tool, S.M., April 1981.
- T. Quinlan, Management Information and Control Systems for Hospital Supplies: A Case Study, S.M., June 1981.
- A.B. Cruickshanks and R.D. Drescher, A Case Study of Production Smoothing in a Job Shop Environment, Joint S.M., February 1982.
- D. Stefek, A Periodic Production Scheduling Problem, S.M., June 1982.
- C. Olson, A Prototype System for Hierarchical Production Planning, S.M., June 1983.
- D. Choing, The Role of Buffer Stocks in a Re-Entrant Flow Shop, S.M., June 1983.
- R. Gould, Quantitative Tools for the Optimization of Selling Efforts in Metropolitan Cable Television Systems, S.M., February 1984.
- P.C. Santos, An Optimization Model for the Configuration of Incoming WATS Lines, S.M., June 1984.
- A.H. Zeghmi, Inventory Buffers for a Production Line with Controllable Production Rates, Ph.D., September 1985.
- C.A. Holmes, Equipment Selection and Task Assignment for Multiproduct Assembly System Design, S.M., January 1987.

- S.H. Parrish, Extensions to a Model for Tactical Planning in a Job Shop Environment, S.M., June 1987.
- S. Mihara, A Tactical Planning Model for a Job Shop with Unreliable Work Stations and Capacity Constraints, S.M., January 1988.
- J. Wagner, Stochastic Programming with Recourse Applied to Groundwater Quality Management, Ph.D., June 1988.
- G. Sy-Quia, A Study of Production Loading in a Job Shop, S.M., June 1988.
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- S. Pappu, A Dual-Ascent Algorithm for Finding the Optimal Testing Strategy, S.M., June 1989.
- H. Zhang, Cyclic Scheduling in a Stochastic Environment, Ph. D., May 1990.
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- R. Munroe, A Framework for Product Development Based on Quality Function Deployment, Traditional Decision-Making Theory, and Design Practice, S.M., June 1990.
- R. M. Coleman, The Effects of Design, Manufacturing Processes, and Operations Management on the Assembly of Aircraft Composite Structure, S.M., June 1991.
- C. Papouras, Lead Time and Inventory Reduction in Batch Chemical Manufacturing, S.M., June 1991.
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- J. Chao, Analysis of Variance Impact on Manufacturing Flow Time, S.M., June 1991.
- B. Koetje, Improving Cycle Times in Batch Chemical Operations, S.M., June 1991.
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