

Amy Ellen Mainville Cohn

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College of Engineering
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Ann Arbor, MI 48109-2117
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EDUCATION

Massachusetts Institute of Technology, Cambridge, MA

Ph.D. in Operations Research, June 2002

Research advisor: Professor Cynthia Barnhart

Dissertation Title: *Composite Variable Modeling for Large-Scale Problems in Transportation and Logistics*

Harvard University, Cambridge, MA

A.B. in Applied Mathematics, June 1991, magna cum laude

Thesis Title: *Multiple Organ Failure: A Model for Treatment Optimization*

EMPLOYMENT AND EXPERIENCE

ADADEMIC

2002 – present University of Michigan

Assistant Professor, Department of Industrial and Operations Engineering

1996 - 2002 Massachusetts Institute of Technology

Research assistant to Professor Cynthia Barnhart

- Network design problems in service parts logistics
- Integrated airline planning problems
- Robust fleet assignment

1998 – 2000 Massachusetts Institute of Technology

Independent research project with Professors Michael Magazine of the University of Cincinnati and George Polak of Wright State University – developing an exact model to determine the optimal clustering of printed circuit boards and the corresponding pick-and-place machine setups

1997 - 1998 Massachusetts Institute of Technology

Independent research project with Professor Lawrence Wein – improving the administration of radiation to cancer patients by optimizing the dosage pattern

1989 – 1991 Harvard University

Research assistant to Professors Myron Fiering and Richard Wilson

- Risk analysis of benzene exposures in an industrial setting
- Modeling of simultaneous organ system failures in ICU patients

INDUSTRY

2007 - Present Nighthawk Radiology Services

Consultant – Developing scheduling tools for radiologist staffing

1997 - 1998 Petrovision, Inc. (Software company developing clustering and routing software for the home fuel delivery industry)

Consultant –Evaluated existing heuristics, contrasted them with exact solution approaches, and proposed alternate heuristics to improve solution quality while maintaining tractability.

1991 - 1996 Princeton Transportation Consulting Group (Software company providing decision support software to the freight transport industry)

Analyst, 1991 – 1995

Participated in client support, sales, and product development for some of the nation's largest less-than-truckload (LTL) carriers. Participated in a total overhaul of the company's flagship LTL product, working closely with clients to redefine product requirements and with developers to redesign the product in an object-oriented environment.

Manager, 1995 - 1996

Managed a staff that provided analysis and product support to clients. Designed and prototyped a real-time product for dynamic load planning, enabling carriers to make use of the data now available from in-cab communication technologies.

PUBLICATIONS

Published or Accepted for Publication

- “Using Composite Variable Modeling to Achieve Realism and Tractability in Production Planning: An Example from Automotive Stamping,” (with Ada Barlatt, Craig Morford, Yakov Fradkin, and Oleg Gusikhin). To appear in *IIE Transactions*.
- “A Recursion-Based Approach to Simulating Airline Schedule Robustness” (with Marcial Lapp, Shervin AhmadBeygi, and Omer Tsimhoni). *Winter Simulation Conference Proceedings 2008*.
- “A Novel Modeling Approach for Express Package Carrier Planning,” (with Sarah Root). To appear in *Naval Research Logistics*.
- “Constructing Pareto-Optimal Residency Call Schedules”. *BMIC Proceedings 2008*.
- “A Hybrid Approach for Solving Shift-Selection and Task-Sequencing Problems” (with Ada Barlatt and Oleg Gusikhin). Lecture Notes in Computer Science: AI and OR Techniques in Constraint Programming for Combinatorial Optimization Problems. Springer Berlin/Heidelberg 2008 pp. 288 – 292.
- “Analysis of the Potential for Delay Propagation in Passenger Airline Networks” (with Shervin AhmadBeygi, Yihan Guan, and Peter Belobaba). To appear in *Journal of Air Transport Management*.
- “An Integer Programming Approach to Generating Airline Crew Pairings” (with Shervin AhmadBeygi and Marshall Weir). To appear in *Computers and Operations Research*.
- “Scheduling Medical Residents at Boston University School of Medicine” (with Sarah Root, Niesha Westmoreland, Justin Esses, and Carisa Kymissis). To appear in *Interfaces*.
- “A Hybridization of Mathematical Programming and Search Techniques for Integrated Operation and Workforce Planning” (with Ada Barlatt, Craig Morford, Oleg Gusikhin, and Yakov Fradkin). Proceedings from IEEE International Conference on Systems, Man, and Cybernetics 2007, pp. 632 - 637.
- “Network Design and Flow Problems with Cross-Arc Costs” (with Melinda Davey, Lisa Schkade, Amanda Siegel, and Caris Wong). *European Journal of Operational Research*, 2008 Vol. 189, No. 3, pp. 890 – 901.
- “Integration of the Load Matching and Routing Problem with Equipment Balancing for Small Package Carriers” (with Sarah Root, Alex Wang, and Doug Mohr). *Transportation Science*, 2007 Vol. 41, pp. 238 – 252.
- “A Framework for Evaluating Production Policies to Improve Customer Responsiveness” (with Selin Kurnaz and Yoram Koren). *CIRP Annals – Manufacturing Technology*, 2005 Vol. 54, No. 1, pp. 401 – 406.
- “Composite-Variable Modeling for Service Parts Logistics” (with Cynthia Barnhart). *Annals of Operations Research*, 2006 Vol. 144, No.1, pp. 17 – 32.

- “Airline Schedule Planning: Accomplishments and Opportunities” (with Cynthia Barnhart), *Manufacturing and Service Operations Management*, Vol. 6, Number 1, 2004.
- “Improving Crew Scheduling By Incorporating Key Maintenance Routing Decisions” (with Cynthia Barnhart). *Operations Research*, Vol. 51, Number 3, 2003.
- “Airline Crew Scheduling” (with Cynthia Barnhart, Ellis Johnson, Diego Klabjan, George Nemhauser, and Pamela Vance) in *Handbook of Transportation Science*, second edition, Kluwer’s International Series, 2003.

Under Review

- “Implicit Bidding Approach for Truckload Procurement and Other Combinatorial Auctions” (with Damian Beil, Richard Chen, and Amitabh Sinha). Under review with *Manufacturing and Service Operations Management*.
- “Decreasing Airline Delay Propagation by Re-Allocating Scheduled Slack” (with Shervin AhmadBeygi and Marcial Lapp). Under review with *Transportation Science*.
- “Solving Truckload Procurement Auctions Over An Exponential Number of Bundles” (with Richard Chen, Shervin AhmadBeygi, Damian Beil, and Amitabh Sinha). Under revision for *Transportation Science*.
- “A Hybridization of Mathematical Programming and Dominance-Driven Enumeration for Solving Shift-Selection and Task-Sequencing Problems” (with Ada Barlatt and Oleg Gusikhin). Under revision for *Computers and Operations Research*.
- “Flow Shop Sequencing: Beyond Makespan Minimization,” (with Selin Kurnaz and Yihan Guan). Under revision for *International Journal of Production Research*.
- “Rank-Cluster-and-Prune: An Algorithm for Generating Clusters in Complex Set Partitioning Problems,” (with Michael Magazine and George Polak). Under second review with *Naval Research Logistics*.
- “A Framework for Incorporating Customer Responsiveness in Production Sequencing,” (with Selin Kurnaz and Yoram Koren). Under second review for *Production Planning and Control*.

Working Papers, White Papers, and Technical Reports

- "Using Implicit Bidding to Solve Truckload Procurement Auctions," with Richard Chen, Shervin AhmadBeygi, Damian Beil and Amitabh Sinha. 2008 NSF CMMI Grantees Conference, Knoxville TN.

- “Lessons Learned Applying Mathematical Programming Techniques to a Healthcare Scheduling Problem” (with Sarah Root).
- “Decreasing Airline Delay Propagation by Re-Allocating Scheduled Slack,” with Shervin AhmadBeygi and Marcial Lapp. 2008 Sloan Industry Studies Working Paper Series.
- “Analysis of the Potential for Delay Propagation in Passenger Airline Networks,” with Shervin AhmadBeygi, Peter Belobaba, and Yihan Guan. 2007 Sloan Industry Studies Working Paper Series.
- “Printed Circuit Board Assembly by Rank-Cluster-and-Prune,” (with Michael Magazine and George Polak). University of Michigan IOE Department technical report TR05-01.
- “A Novel Implementation for Large-Scale Set Partitioning Problems,” (with Dushyant Sharma). University of Michigan IOE Department technical report TR05-09.
- “The Stochastic Knapsack Problem with Random Weights: A Heuristic Approach to Robust Transportation Planning,” (with Cynthia Barnhart). Conference proceedings from TRISTAN III, San Juan, Puerto Rico, June 1998.

FUNDING

- “Decreasing Airline Delay Propagation: Aligning Planning Processes in the Scheduling Phase with Operational Decision Making in the Recovery Phase” Sloan Industry Studies Program Site Visit Grant (awarded May, 2008).
- “CIEG: Simplified Bidding and Solution Structures for Combinatorial Procurement Auctions” NSF SEE (awarded June, 2008).
- “REU: Simplified Bidding and Solution Structures for Combinatorial Procurement Auctions” NSF SEE (awarded June, 2007).
- “Parallel Computing Platforms for Automotive Decision-Support Tools” Ford Motor Company Alliance Program (awarded June, 2007).
- “Decision-Support Tools for Developing Cost-Effective Stamping Plans” Ford Motor Company Alliance Program (awarded June, 2007).
- “Robustness in Airline Planning” Networking Event Grant from the Sloan Industry Studies Program (awarded November, 2006).
- “Simplified Bidding and Solution Structures for Combinatorial Procurement Auctions” NSF SEE (awarded September 2006).
- “Identifying New Research Opportunities to Address Significant Changes Impacting the Passenger Airline Industry” 2005 Sloan Industry Studies Fellowship (awarded December, 2004).

- “Optimization in Real-Life: Tools for Extending the Classroom Experience to the Real World” CRLT Faculty Development Fund (awarded December, 2004).
- “Composite Variable Models for Complex Problems in Transportation and Logistics” Rackham Faculty Development Grant (awarded April 2003).
- “Large-Scale Optimization Techniques for Network Design Problems with Non-Linear Cost Functions” Elizabeth Caroline Crosby Research Fund (awarded April 2003).
- “Developing Successful Research Skills by Studying Research Failures: An Alternative Approach to Teaching Optimization Techniques” CRLT Faculty Development Fund (awarded December 2002).

AWARDS

- Best Technical Presentation, AGIFORS Crew Scheduling Meeting, 2007.
- Alpha Pi Mu *Professor of the Year* award, 2003, 2004, 2006
- Jon R. and Beverly Holt Award for Excellence in Teaching, 2005, 2007
- *Operations Research* 2004 Meritorious Service Award
- Phi Sigma Rho *Outstanding Student Group Advisor* award, 2004
- Honorable Mention, INFORMS Aviation Application Dissertation Prize competition 2003

STUDENTS / RESEARCH PROJECTS

Dissertation Committees (Chair)

- Marcial Lapp, expected Winter 2011
- Richard Chen, expected Winter 2010
- Ada Barlatt, expected Winter 2009
- Shervin Ahmadbeygi, April 2008
- Sarah Root, May 2007
- Selin Kurnaz, Mechanical Engineering, January 2006 (co-chair with Yoram Koren)

Dissertation Committees (Non-Chair)

- Oliver Weide, University of Auckland, External Dissertation Examiner, 2008
- Stefan Witwicki, Electrical Engineering and Computer Science, completion date pending

- Mark Liffiton, Electrical Engineering and Computer Science, completion date pending
- Xiaowei (William) Zhu, Mechanical Engineering, completion date pending
- Yang Liu, Mechanical Engineering, Winter 2008
- Peter Schwartz, Electrical Engineering and Computer Science, Summer 2007
- Shankara Kuppa, Industrial and Operations Engineering, Spring 2007
- Michael Moffitt, Electrical Engineering and Computer Science, Winter 2007
- Hector Carlo, Industrial and Operations Engineering, Fall 2006
- Justin Kile, Industrial and Operations Engineering, Summer 2006
- Archis Ghate, Industrial and Operations Engineering, Summer 2006
- Bart Peintner, Electrical Engineering and Computer Science, Summer 2005

Summer 2008

- On-Call Scheduling for Medical Residents.
- Integrated and Robust Airline Planning: Marcial Lapp (G-PhD), Lindsey Selegue (G-PhD), and Peter Belobaba (Faculty, MIT).
- Models and Algorithms for Scheduling an Automotive Stamping Facility: Ada Barlatt (G-PhD).
- An Implicit Approach to Combinatorial Auctions: Amitabh Sinha (Faculty, Ross School of Business), Damian Beil (Faculty, Ross School of Business), Richard Chen (G-PhD), Shervin Ahmadbeygi (PostDoc).
- *Test-&Prune* -- An Algorithm for Resource Allocation and Resource Utilization Problems: Hao Zhou (G-M), Yiwen Jiang (U), and Tong Wu (U).
- Long-Term Commitment Problems for Wind Energy Generation: Duncan Calloway (Faculty, SNRE), Richard Chen (G-PhD).

Winter 2008

- On-Call Scheduling for Medical Residents: Jennifer Hand (U), Stephanie Clarke (U).
- Integrated and Robust Airline Planning: Shervin Ahmadbeygi (G-PhD), Marcial Lapp (G-M), and Peter Belobaba (Faculty, MIT).
- Models and Algorithms for Scheduling an Automotive Stamping Facility: Ada Barlatt (G-PhD).

- An Implicit Approach to Combinatorial Auctions: Amitabh Sinha (Faculty, Ross School of Business), Damian Beil (Faculty, Ross School of Business), Richard Chen (G-PhD), Shervin Ahmadbeygi (G-PhD).
- *Test-&Prune* -- An Algorithm for Resource Allocation and Resource Utilization Problems: Marshall Weir (U), Ada Barlatt (G-PhD).
- Long-Term Commitment Problems for Wind Energy Generation: Duncan Calloway (Faculty, SNRE), Richard Chen (G-PhD).

Fall 2007

- On-Call Scheduling for Medical Residents: Joe Norman (Faculty, Medical School).
- Integrated and Robust Airline Planning: Shervin Ahmadbeygi (G-PhD), Marcial Lapp (G-M), and Peter Belobaba (Faculty, MIT).
- Models and Algorithms for Scheduling an Automotive Stamping Facility: Ada Barlatt (G-PhD).
- An Implicit Approach to Combinatorial Auctions: Amitabh Sinha (Faculty, Ross School of Business), Damian Beil (Faculty, Ross School of Business), Richard Chen (G-PhD), Shervin Ahmadbeygi (G-PhD), and Tian Jia Zhou (U).
- *Test-&Prune* -- An Algorithm for Resource Allocation and Resource Utilization Problems: Marshall Weir (U), Adam Steenwyk (U), Stephanie Clarke (U), Danielle Scapa (U), Mary Jo Lupino (U), David Tian (U), Ada Barlatt (G-PhD).

Summer 2007

- On-Call Scheduling for Medical Residents: Tian Jia Zhou (U) and Joe Norman (Faculty, Medical School)
- Integrated and Robust Airline Planning: Shervin Ahmadbeygi (G-PhD), Marshall Weir (U), and Peter Belobaba (Faculty, MIT)
- Models and Algorithms for Scheduling an Automotive Stamping Facility: Ada Barlatt (G-PhD), Sean Little (U), and Mary Jo Luppino (U)
- An Implicit Approach to Combinatorial Auctions: Amitabh Sinha (Faculty, Ross School of Business), Damian Beil (Faculty, Ross School of Business), Richard Chen (G-PhD), Shervin Ahmadbeygi (G-PhD), Siti Daud (U), and Jared Davis (U)

Winter 2007

- Integrated and Robust Airline Planning: Shervin Ahmadbeygi (G-PhD), Yihan Guan (U), and Peter Belobaba (Faculty, MIT)
- Models and Algorithms for Scheduling an Automotive Stamping Facility: Ada Barlatt (G-PhD)
- An Implicit Approach to Combinatorial Auctions: Amitabh Sinha (Faculty, Ross School of Business), Damian Beil (Faculty, Ross School of Business), Richard Chen (G-PhD), and Shervin Ahmadbeygi (G-PhD)

Fall 2006

- Integrated and Robust Airline Planning: Shervin Ahmadbeygi (G-PhD), Yihan Guan (U), and Peter Belobaba (Faculty, MIT)
- Models and Algorithms for Scheduling an Automotive Stamping Facility: Ada Barlatt (G-PhD)
- An Implicit Approach to Combinatorial Auctions: Amitabh Sinha (Faculty, Ross School of Business), Damian Beil (Faculty, Ross School of Business), Richard Chen (G-PhD), and Shervin Ahmadbeygi (G-PhD)
- On-Call Scheduling for Medical Residents: Sarah Root (G-PhD), Justin Esses (MD, Boston University School of Medicine), Carisa Kymissis (MD, Boston University School of Medicine), and Niesha Westmoreland (MD, Boston University School of Medicine)
- Integrated Equipment Balancing and Load Routing for Small Package Carriers: Sarah Root (G-PhD)
- Robust Network Design for Developing Nations: Emily Gray (G-PhD)

Summer 2006

- On-Call Scheduling for Medical Residents: Sarah Root (G-PhD), Justin Esses (MD, Boston University School of Medicine), Carisa Kymissis (MD, Boston University School of Medicine), and Niesha Westmoreland (MD, Boston University School of Medicine)
- Integrated Equipment Balancing and Load Routing for Small Package Carriers: Sarah Root (G-PhD)
- Robust Network Design for Developing Nations: Emily Gray (G-PhD) and Dushyant Sharma (Faculty)
- Integrated and Robust Airline Planning: Shervin Ahmadbeygi (G-PhD) and Peter Belobaba (Faculty, MIT)
- Product Sequencing Under Uncertainty to Improve Customer Responsiveness: Yihan Guan (U)

- Models and Algorithms for Scheduling an Automotive Stamping Facility: Ada Barlatt (G-PhD)
- An Implicit Approach to Combinatorial Auctions: Amitabh Sinha (Faculty, Ross School of Business), Damian Beil (Faculty, Ross School of Business), and Richard Chen (G-PhD)

Winter 2006

- On-Call Scheduling for Medical Residents: Sarah Root (G-PhD), Justin Esses (MD, Boston University School of Medicine), Carisa Kymissis (MD, Boston University School of Medicine), and Niesha Westmoreland (MD, Boston University School of Medicine)
- Robust Network Design for Developing Nations: Emily Gray (G-PhD) and Dushyant Sharma (Faculty)
- Integrated Equipment Balancing and Load Routing for Small Package Carriers: Sarah Root (G-PhD)
- Integrated and Robust Airline Planning: Shervin Ahmadbeygi (G-PhD) and Peter Belobaba (Faculty, MIT)
- Product Sequencing Under Uncertainty to Improve Customer Responsiveness: Selin Kurnaz (G-PhD – Mechanical Engineering; co-advised with Yoram Koren)
- Models and Algorithms for Scheduling an Automotive Stamping Facility: Ada Barlatt (G-PhD) and Christy Griffen (U)
- An Implicit Approach to Combinatorial Auctions: Amitabh Sinha (Faculty, Ross School of Business), Damian Beil (Faculty, Ross School of Business), and Richard Chen (G-PhD)

Fall 2005

- Robust Network Design for Developing Nations: Emily Gray (G-PhD) and Dushyant Sharma (Faculty)
- Integrated Equipment Balancing and Load Routing for Small Package Carriers: Sarah Root (G-PhD) and Alex Wang (U)
- Integrated and Robust Airline Planning: Shervin Ahmadbeygi (G-PhD) and Peter Belobaba (Faculty, MIT)
- Product Sequencing Under Uncertainty to Improve Customer Responsiveness: Selin Kurnaz (G-PhD – Mechanical Engineering; co-advised with Yoram Koren)
- Models and Algorithms for Scheduling an Automotive Stamping Facility: Ada Barlatt (G-PhD) and Christy Griffen (U)

- An Implicit Approach to Combinatorial Auctions: Amitabh Sinha (Faculty, Ross School of Business) and Damian Beil (Faculty, Ross School of Business)

Summer 2005

- Integrated Equipment Balancing and Load Routing for Small Package Carriers: Sarah Root (G-PhD) and Alex Wang (U)
- Integrated Airline Planning: Shervin Ahmadbeygi (G-PhD) and Baback Vaziri (U)
- A General Framework for Solving Set Partitioning Problems with Branch-and-Price: Dushyant Sharma (Faculty)
- Product Sequencing Under Uncertainty to Improve Customer Responsiveness: Selin Kurnaz (G-PhD – Mechanical Engineering; co-advised with Yoram Koren)
- Models and Algorithms for Scheduling an Automotive Stamping Facility: Ada Barlatt (G-PhD)
- TMI project, Honeywell CPG

Winter 2005

- Integrated Equipment Balancing and Load Routing for Small Package Carriers: Sarah Root (G-PhD) and Alex Wang (U)
- Integrated Airline Planning: Shervin Ahmadbeygi (G-PhD) and Baback Vaziri (U)
- A General Framework for Solving Set Partitioning Problems with Branch-and-Price: Dushyant Sharma (Faculty)
- Robust Network Design for Rural Transport Infrastructure: Emily Gray (G-PhD)
- Product Sequencing Under Uncertainty to Improve Customer Responsiveness: Selin Kurnaz (G-PhD – Mechanical Engineering; co-advised with Yoram Koren) and Akshay Srimal (U)
- Models and Algorithms for Scheduling an Automotive Stamping Facility: Ada Barlatt (G-PhD)

Fall 2004

- Integrated Equipment Balancing and Load Routing for Small Package Carriers: Sarah Root (G-PhD) and Holly Shoals (U)

- Crew Scheduling Pricing Problems: Shervin Ahmadbeygi (G-PhD) and Kristen Neubauer (U)
- A General Framework for Solving Set Partitioning Problems with Branch-and-Price: Dushyant Sharma (Faculty)
- Product Sequencing Under Uncertainty to Improve Customer Responsiveness: Selin Kurnaz (G-PhD – Mechanical Engineering; co-advised with Yoram Koren) and Elsa Mersereau (U)

Summer 2004

- Equipment Balancing for Freight Transportation: Holly Shoals (U)
- Crew Scheduling Pricing Problems: Shervin Ahmadbeygi (G-PhD) and Mark Sytsma (U)
- Emergency Department Diversion Modeling: Sarah Root (G-PhD)
- A General Framework for Solving Set Partitioning Problems with Branch-and-Price: Shervin Ahmadbeygi (G-PhD), Mark Sytsma (U), Holly Shoal (U), and Dushyant Sharma (Faculty)
- Simultaneous Sequencing and Lot-Sizing to Minimize Makespan: Selin Kurnaz (G-PhD – Mechanical Engineering; co-advised with Yoram Koren)

Winter 2004

- Crew Scheduling Pricing Problems: Shervin Ahmadbeygi (G-PhD) and Mark Sytsma (U)
- Equipment Balancing for Freight Transportation: Lisa Schkade (G-M)
- Emergency Department Diversion Modeling: Sarah Root (G-PhD)
- Printed Circuit Board Manufacturing: Reid Tatoris (U)
- Simultaneous Sequencing and Lot-Sizing to Minimize Makespan: Selin Kurnaz (G-PhD – Mechanical Engineering; co-advised with Yoram Koren)

Fall 2003

- Crew Scheduling Pricing Problems: Shervin Ahmadbeygi (G-PhD)
- Network Design Problems with Non-Linear Costs: Melinda Davey (G-M), Lisa Schkade (G-M), Caris Wong (U)
- Printed Circuit Board Manufacturing – Research and Curriculum Development: Sarah Root (G-PhD) and Reid Tatoris (U)
- Simultaneous Sequencing and Lot-Sizing to Minimize Makespan: Selin Kurnaz (G-PhD – Mechanical Engineering; co-advised with Yoram Koren)

Summer 2003

- Crew Scheduling Pricing Problems: Shervin Ahmadbeygi (G-PhD)
- Network Design Problems with Non-Linear Costs: Melinda Davey (G-M), Caris Wong (U), and Amanda Siegel (U)
- Printed Circuit Board Manufacturing – Research and Curriculum Development: Sarah Root (G-PhD) and Reid Tatoris (U)
- Curriculum development: Buan Pong Chua (U)
- “Managing the Effects of Production Variability on Material Release Stability,” TMI project, Ford Motor Company.

Winter 2003

- Integrated Airline Planning Models: KoMing Liu (G-M)
- Network Design Problems with Non-Linear Costs: Melinda Davey (G-M) and Lisa Schkade (G-M)
- Printed Circuit Board Manufacturing – Research and Curriculum Development: Sarah Root (G-PhD), David Stajninger(U), and Reid Tatoris (U)
- Supervised Readings in Network Flows: Buan Pong Chua (U)

PRESENTATIONS

- “Schedule Optimization and Operational Realities” at MIT Executive Education Program, June 2008.
- “‘Optimized’ Airline Plans and Operational Realities” Fields Lecture, University of Toronto, June 2008.
- “A Hybrid Approach for Solving Shift-Selection and Task-Sequencing Problems” at CP-AI-OR May 2008, Paris, with Ada Barlatt and Oleg Gusikhin.
- “Planning, Operations, and Robustness” panel at AGIFORS Operations meeting, Amsterdam, May 2008.
- “Wheels, Windmills, and Weekends: A New Algorithm for Discrete Optimization Problems” presented at the University of Pittsburgh, April 2008.
- “Achieving Robustness Without Increasing Cost: A New Planning Tool for Passenger Aviation” Sloan Industry Studies Program Annual Meeting April

2008, Cambridge MA. With Peter Belobaba, Marcial Lapp, and Shervin AhmadBeygi.

- “Simplified Bidding and Solution Structures for Combinatorial Procurement Auctions” NSF Grantees Meeting Knoxville, TN January, 2008 with Damian Beil, Amitabh Sinha, Shervin AhmadBeygi, and Richard Chen.
- “Delay Propagation and Airline Planning: Research Overview,” at Lufthansa, Frankfurt Germany, December 2007.
- “Truckload Procurement Auctions: Demonstrating an Implicit Bidding Mechanism,” STIET Seminar Series, November 2007 in Ann Arbor, MI.
- “Solving Single-Round, Fully Enumerated Combinatorial Truckload Procurement Auctions to Optimality” at INFORMS Fall 2007, Seattle, with Richard Chen (speaker), Shervin AhmadBeygi, Damian Beil, and Amitabh Sinha.
- “Test-and-Prune Approach to High-Level and Low-Level Resource Planning” at INFORMS Fall 2007, Seattle, with Ada Barlatt (speaker).
- “Stochastic Combinatorial Truckload Procurement Auctions” at INFORMS Fall 2007, Seattle, with Shervin AhmadBeygi (speaker), Richard Chen, Damian Beil, and Amitabh Sinha.
- “Measuring and Minimizing Delay Propagation in Passenger Airline Plans” at INFORMS Fall 2007, Seattle, with Shervin AhmadBeygi (speaker) and Peter Belobaba.
- “Constructing OnCall Schedules for Medical Residents” at INFORMS Fall 2007, Seattle, with Joseph Norman.
- “Labor Allocation in Automotive Planning: Leveraging a Flexible Work Force” at INFORMS Fall 2007, Seattle, with Ada Barlatt (speaker), Mary Jo Luppino, and Oleg Gusikhin.
- “Robust Schedule Planning and Recovery” at INFORMS Fall 2007, Seattle, (AAS Panel).
- “Assessing Delay Propagation in Airline Plans: An Update, ” at 2007 IAB Meeting of the MIT Global Airline Industry Program, Cambridge, MA, October 2007, with Shervin AhmadBeygi, Marcial Lapp, and Peter Belobaba.
- “Stochastic Truckload Procurement Auctions, ” at 9th Midwest Optimization Conference, October 2007 in Ann Arbor, MI with Shervin AhmadBeygi (speaker), Damian Beil, Richard Chen, and Amitabh Sinha.
- “A Hybridization of Mathematical Programming and Search Techniques for Integrated Operation and Workforce Planning, ” at IEEE Conference on Systems, Man, and Cybernetics, October 2007 in Montreal with Ada Barlatt and Oleg Gusikhin.

- “Measuring and Minimizing Delay Propagation in Passenger Airline Plans” at INFORMS Midwest Regional Conference, August 2007 in Evanston, IL with Shervin Ahmadbeygi (speaker) and Peter Belobaba.
- “An Implicit Bidding Mechanism for Combinatorial Auctions” at INFORMS Midwest Regional Conference, August 2007 in Evanston, IL with Richard Chen (speaker), Shervin Ahmadbeygi, Amitabh Sinha, and Damian Beil.
- “A Parallel Algorithm for Solving Resource Allocation and Scheduling Problems” at INFORMS Midwest Regional Conference, August 2007 in Evanston, IL with Ada Barlatt, Mary Jo Luppino, and Tian Jia Zhou.
- “Using Composite Variable Modeling to Achieve Realism and Tractability in Production Planning” at INFORMS International, July 2007 in Puerto Rico with Ada Barlatt (speaker).
- “Robust Schedule Planning and Recovery: The Role of Operations Research” at MIT Executive Education Program, June 2007.
- “Resident Scheduling and Medical Decision Making” at University of Michigan Medical School Residency Seminar Series, June 2007 in Ann Arbor with Joe Norman.
- “Measuring and Minimizing Delay Propagation in Airline Plans” at AGIFORS / INFORMS AAS / Sloan Networking Event, May 2007 in Denver, CO with Shervin Ahmadbeygi, Yihan Guan, and Peter Belobaba.
- “Airline Planning to Minimize Delay Propagation,” at IIE Annual Meeting, May 2007 in Nashville, TN with Shervin Ahmadbeygi (speaker), Yihan Guan, and Peter Belobaba.
- “Incorporating Robustness in Passenger Aviation Planning Models,” at Sloan Industry Studies Program Annual Meeting, April 2007 in Cambridge, MA with Shervin Ahmadbeygi, Yihan Guan, and Peter Belobaba.
- “Using Mathematical Programming to Make VCG Auctions Tractable: Truckload Procurement,” invited seminar speaker at University of Illinois Urbana-Champaign, March 2007, joint work with Damian Beil, Amitabh Sinha, Shervin Ahmadbeygi, and Richard Chen.
- “A New Modeling Approach for Scheduling Stamping Operations” at INFORMS Fall 2006, Pittsburgh, with Ada Barlatt (speaker), Yakov Fradkin, and Oleg Gusikhin.
- “Assessing Delay Propagation in Airline Plans” at INFORMS Fall 2006, Pittsburgh, with Shervin Ahmadbeygi (speaker), Yihan Guan, and Peter Belobaba.
- “Developing Fair and Feasible Schedules for Residents On-Call” at INFORMS Fall 2006, Pittsburgh, with Sarah Root (speaker).
- “Simplified Bidding and Solution Mechanisms for VCG Combinatorial Auctions” at INFORMS Fall 2006, Pittsburgh, with Damian Beil (speaker), and Amitabh Sinha.

- “Using Composite Variable Modeling to Solve Integrated Freight Transportation Planning Problems” at INFORMS Fall 2006, Pittsburgh, with Sarah Root (speaker).
- “Assessing Delay Propagation in Airline Plans” at the MIT Global Airline Industry Program annual Industry Advisory Board meeting in Cambridge, Massachusetts October 2006, with Shervin AhmadBeygi, Yihan Guan, and Peter Belobaba.
- “Using Mathematical Programming to Make VCG Auctions Tractable” at the University of Michigan Toyota AI Seminar Series, October 2006, with Damian Beil, Amitabh Sinha, Shervin AhmadBeygi, and Richard Chen.
- “Incorporating Reliability, Responsiveness, and Realism in Production Planning and Sequencing” at Intelligent Maintenance Decision-Making Workshop: Needs, Practices and Solutions May 2006, with Ada Barlatt, Yoram Koren, and Selin Kurnaz.
- "Scheduling Methods for Complex Systems: A Hybridization of Mathematical Programming and Heuristic Search" ERC TAC Meeting May 2006, with Ada Barlatt.
- "A Sequence-Dependent Clustering Model" POMS 2006, with George Polak (speaker) and Ahmet Keha.
- "Models and Algorithms for Scheduling in Automotive Stamping Plants" POMS 2006, with Ada Barlatt.
- "Incorporating Customer Responsiveness When Solving Blocking Flowshop Scheduling Problems" POMS 2006, with Selin Kurnaz.
- “Models and Algorithms for Scheduling in Automotive Stamping Plants”, invited seminar presentation at Ford Motor Company. February 15, 2006, with Ada Barlatt (speaker), Christina Griffen, Yakov Fradkin, Oleg Gusikhin, and Guiseppe Rossi.
- “Integration of the Load Matching and Routing Problem with Empty Balancing with Equipment Balancing for Small Package Carriers” invited session at Sloan Foundation Industry Studies Program annual meeting, December 2005.
- “Modeling Complex Systems to Ensure Implementable Solutions: Imbedding Complexity in the Variable Definition” invited seminar speaker at University of Colorado, December 2005.
- “Modeling Complex Systems to Ensure Implementable Solutions: Imbedding Complexity in the Variable Definition” invited seminar speaker at Northwestern University, November 2005.
- “Solving Large Crew Pairing Problems for Integrated and Robust Planning” presented at INFORMS Fall 2005, San Francisco, California, with Shervin AhmadBeygi (speaker).

- “Models and Algorithms for Scheduling in Automotive Stamping Plants” presented at INFORMS Fall 2005, San Francisco, California, with Ada Barlatt, Christy Griffen, Yakov Fradkin, Oleg Gusikhin, and Giuseppe Rossi.
- “Integrated Planning for Small Package Carriers” presented at INFORMS Fall 2005, San Francisco, California, with Sarah Root (speaker) and Alex Wang.
- “Hands-On Teaching of the Optimization Process” presented at INFORMS Fall 2005, San Francisco, California.
- “An Optimization Approach to Solving the Airline Crew Pairing Problem” presented at IIE 2005, Atlanta, Georgia, with Shervin AhmadBeygi.
- “A Framework for Evaluating Production Policies to Improve Customer Responsiveness” presented at IIE 2005, Atlanta, Georgia, with Selin Kurnaz and Yoram Koren.
- “Integrated Load Matching and Equipment Balancing for Express Package Networks” presented at IIE 2005, Atlanta, Georgia, with Sarah Root.
- “Equipment Matching and Balancing for an Express Package Network” presented at INFORMS Fall 2004, Denver, Colorado, with Sarah Root and Holly Shoals.
- “An Optimization Approach to Solving the Airline Crew Pairing Problem” presented at INFORMS Fall 2004, Denver, Colorado, with Shervin Ahmadbeygi.
- “Dominance and Indifference in Airline Crew Scheduling” presented at INFORMS Fall 2003, Atlanta, Georgia, October 2003, with KoMing Liu and Shervin Ahmadbeygi.
- “Makespan Optimization: Cost and Responsiveness” presented at NSF review of ERC on Reconfigurable Manufacturing Systems, May 2004.
- “A Network Design Problem in Freight Transportation with Non-Linear, Cross-Arc Costs” presented at INFORMS Fall 2003, Atlanta, Georgia, October 2003, with Melinda Davey, Lisa Schkade, Amanda Siegel, and Caris Wong.
- “Developing Successful Research Skills by Studying Research Failures: An Alternative Approach to Teaching Optimization Techniques” presented at INFORMS Teaching Colloquium Fall 2003, Atlanta, Georgia, October 2003.
- “Printed Circuit Board Manufacturing and Large-Scale Optimization Techniques” presented at M&SOM Conference, USC, June 2003, with Sarah Root, David Stajninger, and Reid Tatoris (U of Michigan) , Michael Magazine (U of Cincinnati), and George Polak (Wright State U).
- “Dominance and Indifference in Airline Planning Decisions” presented at NEXTOR-FAA-INFORMS Conference, Virginia Tech, June 2003, with KoMing Liu and Shervin Beygi (U of Michigan).

- “Composite Variable Models for Large Transportation and Logistics Problems” presented at University of Chicago, March 2002; Princeton University, February 2002; Cornell University, February 2002; University of Maryland, February 2002; University of Michigan, January 2002; University of Cincinnati, December 2001.
- “Network Design for Service Parts Logistics,” presented at INFORMS Fall 2001, Miami, Florida, November 2001, with Cynthia Barnhart and Wilson Tandonio (MIT) and Keith Howells and Juwono Bong (UPS).
- “Improving Crew Scheduling By Incorporating Key Maintenance Routing Decisions,” presented at TRISTAN IV, Portugal, June 2001, with Cynthia Barnhart (MIT).
- “Improving Crew Scheduling By Incorporating Key Maintenance Routing Decisions,” presented at INFORMS Fall 2000, San Antonio, Texas, November 2000, with Cynthia Barnhart (MIT).
- “Improving Airline Crew Schedules By Expanding the Solution Space,” presented at ISMP 2000, Atlanta, Georgia, August 2000, with Cynthia Barnhart (MIT).
- “A Column Generation Approach to Product Clustering and Machine Setup in Printed Circuit Board Assembly,” presented at INFORMS Spring 2000, Salt Lake City, Utah, May 2000, with Michael Magazine (U of Cincinnati) and George Polak (Wright State U.).
- “The Stochastic Knapsack Problem with Random Weights: A Heuristic Approach to Robust Transportation Planning,” presented at TRISTAN III, San Juan, Puerto Rico, June 1998, with Cynthia Barnhart (MIT).
- “Optimization of a Linear-Quadratic Model with Volume-Dependent Sensitivity & Repopulation: A Rationale for Concomitant Boost Therapy,” presented at INFORMS 2008, Montreal, with Lawrence Wein (MIT, speaker).

TEACHING

- IOE310 Introduction to Optimization, University of Michigan, 2002 (4.81 / 5), 2003 (4.88 / 5), 2004 (4.80 / 5), 2006 (4.83 / 5)
- IOE510 Linear Programming I, University of Michigan, 2003 (4.83 / 5), 2005W (4.82 / 5), 2005F (4.15 / 5), 2007 (4.63 / 5), 2008 (4.67 / 5)
- IOE591 Models and Algorithms for Large-Scale Optimization Problems, University of Michigan, 2005 (5.00 / 5), 2006 (5.00 / 5), 2007 (4.67 / 5)
- IOE640 Mathematical Modeling of Operational Systems, University of Michigan, 2006 (4.50 / 5.00), 2008 (4.71 / 5)
- Lecturer for Airline Schedule Planning – MIT, 2001

- Teaching assistant for Transportation Operations, Planning and Control: Carrier Systems – MIT, 2000
- Teaching assistant for Optimization of Transportation Systems – MIT, 1998
- Teaching assistant for Discrete Mathematics – Harvard Extension School, 1993
- Guest lecturer for Optimization of Transportation Systems -- MIT, 2000
- Guest lecturer for Quantitative Foundations of Decision Support Systems -- Babson College, 2000
- Author of case study "Making the Trade-off Between Optimality and Tractability When Solving Large Transportation Models: A Case Study on the Airline Industry."

PANELS/NON-ACADEMIC TALKS

- INFORMS Doctoral Colloquium, October 2008.
- CoE Panel on Teaching Effectiveness, March 2008.
- Panelist for INFORMS Doctoral Colloquium on Service, November 2007.
- Panelist for Rackham Seminar on Finding an Advisor, January 2007.
- Panelist, Women in Science and Engineering luncheon, November 2006.
- Panelist on Work/Family Balance, INFORMS Annual Meeting, San Francisco CA, November 2005.
- Panelist for Rackham-CRLT Seminar on College Teaching, May 2004.
- "The Academic Job Search" presented at INFORMS Doctoral Colloquium Fall 2003, Atlanta, Georgia, October 2003.
- Faculty contributor, Academic Careers in Engineering and Sciences program, "Mentoring." University of Michigan, November 2003.
- Speaker, Tech Day, November 2003.
- Faculty contributor, American Society for Engineering Education Future Faculty Series, "Teaching at the University of Michigan." University of Michigan, October 2003.
- Panel member, 2002 SWE Women's Symposium, University of Michigan.
- Panel member, 2002 INFORMS meeting on "The Art and Practice of IOE Research," University of Michigan.

PROFESSIONAL AFFILIATIONS AND ACTIVITIES

- Member of INFORMS (AAS, WORMS, JFIG), IIE, ASEE, AGIFORS.
- Secretary/Treasurer INFORMS AAS, 2005, 2006; Vice-Chair, 2007, 2008
- Affiliate, Sloan Industry Studies Program
- Affiliate, MIT Global Airline Industry Program
- Review panel member, NSF SEE proposals, Washington D.C., December 2007
- Review panel, Qatar, 2007
- Review panel member, NSF, CCLI EMD and ND proposals, Washington D.C., July 2003, 2004, 2005, 2006
- Review panel member, NSF OR proposals, Washington D.C., December 2003
- Committee member, Sloan Foundation Industry Studies Program Early Career Development Committee (inaugural member; chair 2006 - 2008)
- Committee member, University of Michigan Presidential Initiative for a Healthy Community, 2004 - 2006
- Committee member, IOE Undergraduate Curriculum Committee 2004 – present
- Committee member, IOE Computing Committee 2006 – present
- Committee member, IOE Department Committee 2003 – 2004, 2005 – 2006
- Committee member, University of Michigan College of Engineering Strategic Planning Advisory Committee, 2002 – 2003
- Committee member, CoE Ad Hoc Safety Committee on Emergency Planning, 2007
- Organizer, Seven joint Sloan/INFORMS sessions, D.C. October 2008.
- Organizer, Alfred P. Sloan Foundation Industry Studies Program Networking Event on Robust Airline Planning, May 2007
- Coordinator, Masters Colloquium, INFORMS Practitioners Conference, April 2005
- Organizer, INFORMS session on Aviation Applications, Atlanta, October 2003

- Coordinator, NEXTOR-FAA-INFORMS Conference, Washington D.C., June 2003
- Coordinator, departmental seminar series, Fall 2003
- Initiator, faculty coordinator – *Perspectives From Industry* seminar series, Winter 2003
- Coordinator – East Coast Round Table on OR Models in e-Commerce, March 2001
- Coordinator – MIT Operations Research Center Seminar Series, Fall 2000
- Coordinator – MIT Operations Research Center IAP lecture series, January 1998

- Referee for: *IIE Transactions* (2004, 2005, 2008); *OR Spektrum* (2004, 2005); *Transportation Science* (2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008); *Annals of Operations Research* (2002); *Naval Research Logistics* (2001, 2002, 2003, 2006, 2007); *Operations Research* (2002, 2003, 2004, 2005, 2006, 2007, 2008); *Computers and Operations Research* (2003, 2007); *Health Care Management Science* (2003, 2004, 2005, 2006, 2007, 2008); *Omega* (2005, 2006); *European Journal of Operational Research* (2005, 2006, 2007, 2008); *INTERFACES* (2005, 2008); *OR Letters* (2005); *Management Science* (2006); *IERC Conference Proceedings* (2007); *Journal on Global Optimization* (2006, 2007); *Journal of the Operational Research Society* (2008), *Manufacturing and Service Operations Management* (2008); *Transportation Research Part B* (2008).

- Faculty advisor, SWE, 2004 - present
- Faculty advisor, Phi Sigma Rho (undergraduate engineering sorority) 2003 – present
- Faculty advisor, IIE University of Michigan student chapter 2002 – 2004
- Faculty advisor, Michigan Engineering Consulting Club, 2007 - present

- Participant, Provost's Seminar on Teaching, April 2003, November 2003

- Judge, Murty Prize, 2006
- Judge, Honors Committee, College of Engineering, 2006
- Judge, Sloan Industry Studies Dissertation Prize, 2005, 2006, 2007
- Judge, INFORMS Aviation Applications Dissertation Prize, 2005, 2007
- Judge, University of Michigan SWE Scholarship, 2004, 2005

- Judge, INFORMS TSL Dissertation Competition, 2004

- Volunteer, Wines Elementary School, 2007, 2007, 2008