

# Diego Klabjan

2145 Sheridan Road, IEMS  
Evanston, IL 60208  
Director, Master of Science in Analytics  
Tel: 847-491-0663  
Email: [d-klabjan@northwestern.edu](mailto:d-klabjan@northwestern.edu)  
[www.klabjan.dynresmanagement.com](http://www.klabjan.dynresmanagement.com)  
[www.analytics.northwestern.edu](http://www.analytics.northwestern.edu)

## General Interests

- Sustainability (smart grid, green transportation, renewable energy)
- Transportation
- Supply Chain Management
- Retail
- Large-scale Optimization

## Education

- **Ph. D. in Algorithms, Combinatorics, and Optimization**  
Georgia Institute of Technology, Atlanta, GA 1999  
*Dissertation:* Topics in Airline Crew Scheduling and Large Scale Optimization (*Advisors:* George Nemhauser and Ellis Johnson)
- **B.S. in Applied Mathematics**  
University of Ljubljana, Ljubljana, Slovenia 1994  
*Dissertation:* A Randomized Algorithm for Computing the Volume of a Convex Set (*Advisor:* Bojan Mohar)

## Work Experience

- 2007-present: Associate professor, Northwestern University, Department of Industrial Engineering and Management Sciences, Evanston, Illinois
- 2006-2007: Associate professor, University of Illinois at Urbana-Champaign, Department of Civil and Environmental Engineering, Urbana, Illinois
- 2005-2006: Visiting professor, MIT, Department of Civil and Environmental Engineering, Cambridge, Massachusetts
- 1999-2005: Tenure-track assistant professor, University of Illinois at Urbana-Champaign, Department of Mechanical and Industrial Engineering, Urbana, Illinois

## Awards

- 2011 Student Paper Contest, Railway Application Section of INFORMS, Second prize, Charlotte, NC (by post-doctoral student Conrado Borraz)
- 2006 Best Student Paper, The 22nd International Conference on Data Engineering, Atlanta, GA (by graduate student Hector Gonzales)
- 2004 Anna Valicek Medal Winner, AGIFORS, Singapore (by graduate student Rivi Sandhu)
- 2000 First Prize Transportation Science Section Dissertation Prize, INFORMS, Washington DC
- 1994 Preseren's Award for the Best Undergraduate Thesis, University of Ljubljana, Slovenia

## Refereed Publications

1. L. Guimaraes, D. Klabjan, B. Almada-Lobo, Annual Production Budget in the Beverage Industry. To appear in the *International Scientific Journal Engineering Applications of Artificial Intelligence*.

2. P. Bless, D. Klabjan, and S. Chang , Automated Knowledge Source Selection and Service Composition. To appear in *Computational Optimization and Applications*.
3. Y. Zhao and D. Klabjan, A Polyhedral Study of Lot-sizing with Supplier Selection. To appear in *Discrete Optimization*.
4. M. Sohoni, Y-C. Lee, D. Klabjan, Block Time Estimation and Robust Airline Scheduling. *Transportation Science* 45 (2011) 451-464.
5. D. Klabjan and J. Pei, In-store One-to-one Marketing. *Journal of Retailing and Consumer Services* 18 (2011) 64-73.
6. D. Adelman and D. Klabjan, Computing Near Optimal Policies in General Joint Replenishment. To appear in *INFORMS Journal on Computing*.
7. S. Chang, D. Klabjan, and T. Vossen, Optimal Radio Frequency Identification Deployment in a Supply Chain Network. *International Journal of Production Economics* 125 (2010) 71-83.
8. L. Schenk and D. Klabjan, Intra Market Optimization for Express Package Carriers with Station to Station Travel and Proportional Sorting. *Computers & Operations Research* 37 (2010) 1749-1761.
9. J. Pei and D. Klabjan, Inventory Control in Serial Systems under Radio Frequency Identification. *International Journal of Production Economics* 123 (2010) 118-136.
10. S. Choo, D. Klabjan and D. Simchi-Levi, Multi-ship Crane Sequencing with Yard Congestion Constraints. *Transportation Science* 44 (2010) 98-115.
11. H. Gonzalez, J. Han, H. Cheng, X. Li, D. Klabjan and T. Wu, Modeling Massive RFID Datasets: A Gateway-Based Movement-Graph Approach. *IEEE Transactions on Knowledge and Data Engineering* 22 (2010) 90-104.
12. B. Almada-Lobo, D. Klabjan, M.A. Carravilla and J.F. Oliveira, Multiple Machine Multi-Item Continuous Setup Lotsizing with Sequence-dependent Setups. *Computational Optimization and Applications* 47 (2010) 529-552.
13. L. Schenk and D. Klabjan, Intra Market Optimization for Express Package Carriers. *Transportation Science* 42 (2008) 530-545.
14. N. Halman, D. Klabjan, M. Mostagir, J. Orlin, D. Simchi-Levi, A Fully Polynomial Time Approximation Scheme for Single-Item Stochastic Inventory Control Problems with Discrete Demand. *Mathematics of Operations Research* 34 (2009) 674-685.
15. D. Klabjan, Subadditive Approaches in Integer Programming. *European Journal of Operational Research* 183 (2007) 525-545.
16. B. Almada-Lobo, D. Klabjan, M.A. Carravilla, J.F. Oliveira, Single Machine Capacitated Lotsizing Problem with Sequence-dependent Setup Costs and Times. *International Journal of Production Research* 45 (2007) 4873-4894.
17. J. Han, H. Gonzales, X. Li, and D. Klabjan, Warehousing and Mining Massive RFID Data Sets, *Lecture Notes in Computer Science* 4093 (2006) 1-18.
18. D. Klabjan and D. Adelman, A Convergent Infinite Dimensional Linear Programming Algorithm for Deterministic Semi-Markov Decision Processes on Borel Spaces. *Mathematics of Operations Research* 32 (2007) 528-550.
19. P. Bless, D. Klabjan, and S. Chang, Heuristics for Automated Knowledge Source Selection and Service Composition. *Computers and Operations Research* 35 (2008) 1292-1314.
20. R. Sandhu and D. Klabjan, Fleeting with Passenger and Cargo Origin-Destination Booking Control. *Transportation Science* 40 (2006) 517-528.
21. R. Sandhu and D. Klabjan, Integrated Airline Fleeting and Crew Pairing Decisions. *Operations Research* 55 (2007) 430-438.
22. D. Klabjan and D. Adelman, Existence of Optimal Policies for Semi-Markov Decision Processes Using Duality for Infinite Linear Programming, *SIAM Journal on Control and Optimization* 44 (2006) 2104-2122.
23. S. Shebalov and D. Klabjan, Robust Airline Crew Pairing: Move-up Crews, *Transportation Science* 40 (2006) 300-312.
24. S. Shebalov and D. Klabjan, Sequence Independent Lifting for Mixed Integer Programs with Variable Upper Bounds. *Mathematical Programming* 105 (2006) 523-561.
25. P.N. Bless, S.G. Kapoor, R.E. DeVor, and D. Klabjan, An Algorithmic Strategy for Automated Development of Multi-component Software Tools for Virtual Manufacturing. *Journal of Manufacturing Science and Engineering* 127 (2005) 866-874.
26. D. Adelman and D. Klabjan, Existence of Optimal Policies and Duality in Generalized Joint Replenishment. *Mathematics of Operations Research* 30 (2005) 28-50.
27. D. Klabjan, A Practical Algorithm for Computing the Subadditive Dual Function for Set Partitioning, *Computational Optimization and Applications* 29 (2004) 347-368.
28. A. Makri and D. Klabjan, Algorithms for Source-to-all Maximum Cost to Time Ratio Problem in Acyclic Networks. *Networks* 42 (2003) 1-14.

29. D. Klabjan, E.L. Johnson, and G.L. Nemhauser, Airline Crew Scheduling with Time Windows and Plane Count Constraints, *Transportation Science* 36 (2002) 337-348.
30. D. Klabjan and G.L. Nemhauser, A Polyhedral Study of Integer Variable Upper Bounds. *Mathematics of Operations Research* 27 (2002) 711-739.
31. A. Arora and D. Klabjan, A Model for Budget Allocation in Multi-unit Libraries. *Library Collections, Acquisitions, and Technical Services* 26 (2002) 423-438.
32. A. Makri and D.Klabjan, A New Pricing Scheme for Airline Crew Scheduling, *INFORMS Journal on Computing* 16 (2004) 56-67.
33. D. Klabjan, E.L. Johnson, and G.L. Nemhauser, Solving Large Airline Crew Scheduling Problems: Random Pairing Generation and Strong Branching, *Computational Optimization and Applications* 20 (2001) 73-91.
34. D. Klabjan, E.L. Johnson, and G.L. Nemhauser, Airline Crew Scheduling with Regularity, *Transportation Science* 35 (2001) 359-374.
35. D. Klabjan, E.L. Johnson, and G.L. Nemhauser, A Parallel Primal-Dual Simplex Algorithm, *Operations Research Letters* 27 (2000) 47-55.
36. D. Klabjan and B. Mohar, The Number of Matchings of Low Order in Hexagonal Systems, *Discrete Mathematics* 186 (1998) 167-175.
37. D. Klabjan, C. Tovey, and G.L. Nemhauser, Cover Inequality Separation is NP-hard, *Operations Research Letters* 23 (1998) 35-40.

## Chapters in Books

- Y. Jiang, D. Klabjan, L. Williams (2010), Analytics in Retail. Forthcoming in *Encyclopedia in Operations Research and Management Sciences*, Wiley & Sons.
- T. Sweda and D. Klabjan (2010), The Nascent Industry of Electric Vehicles. Forthcoming in *Encyclopedia in Operations Research and Management Sciences*, Wiley & Sons.
- Y-C. Lee, D. Klabjan, G. Stojkovic (2009), Crew Management Information Systems. In B. Smith and C. Barnhart, editors, *Quantitative Problem Solving Methods in the Airline Industry: A Modeling Methodology*, Springer Verlag
- C. Taylor, D. Klabjan, and H. Mamani (2008), Advanced Optimization for Interplanetary Logistics. In O. de-Weck and B. Shisko, editors, *Interplanetary Supply Chain Management and Logistics Architecture*.
- C. Barnhart, A. Cohn, E.L. Johnson, D. Klabjan. G.L. Nemhauser, and P.Vance (2002), Airline Crew Scheduling. In Hall, R.W., editor, *Handbook in Transportation Science*, Kluwer Scientific Publishers.
- D. Klabjan (2005), Large-scale Models in the Airline Industry. In G. Desaulniers, J. Desrosiers, M.M. Solomon, editors, *Column Generation*, Kluwer Academic Publishers.
- D. Klabjan (2007), Radio Frequency Identification Enabled Business Applications in Supply Chain Management. In T. Blecker and G. Huang, editors, *RFID in Operations and Supply Chain Management: Research and Applications*, Erich Schmidt Verlag.

## Peer-Reviewed Conference Proceedings

- T. Sweda and D. Klabjan (2011), "An Agent-Based Decision Support System for Electric Vehicle Charging Infrastructure Deployment," *7th IEEE Vehicle Power and Propulsion Conference*, Chicago, Illinois.
- O. Worley and D. Klabjan (2011), "Optimization of Battery Charging and Purchasing at Electric Vehicle Battery Swap Stations," *7th IEEE Vehicle Power and Propulsion Conference*, Chicago, Illinois.
- S. Ruangpattana, D. Klabjan, J. Arinez, and S. Biller (2011), "Optimization of On-site Renewable Energy Generation for Industrial Sites," *Proceedings of IEEE Power Systems 2011*, Phoenix, AZ.
- D. Klabjan and D. Yang (2010), "Strategic Gang Scheduling in the Railway Industry," *Proceedings of TRISTAN VII*.
- C. Cheng, C. Chekuri, and D. Klabjan (2009), "Topology Formation for Wireless Mesh Network Planning," *Proceedings of IEEE Infocom 2009 Mini-conference*, Rio de Janeiro, Brazil.
- N. Halman, D. Klabjan, C-L. Li, J. Orlin, and D. Simchi-Levi (2008), "Fully Polynomial Time Approximation Schemes for Stochastic Dynamic Programs," *Proceedings of ACM-SIAM Symposium on Discrete Algorithms*, San Francisco, CA.
- J. Pei and D. Klabjan (2007), "Inventory Control in Serial Systems under RFID," *EPC Connection Academic Convocation*,

Chicago, IL.

- D. Klabjan (2007), "Radio Frequency Identification Enabled Business Applications in Supply Chain Management," *Proceedings of RFID Live 2007 Academic Convocation*, Orlando, FL.
- J. Han, H. Gonzalez, X. Li, and Diego Klabjan (2006), "Warehousing and Mining Massive RFID Data Sets," *Proceedings of the International Conference on Advanced Data Mining and Applications*, Xi'An, China.
- H. Gonzales, J. Han, X. Li, and D. Klabjan (2006), "Warehousing and Analyzing Massive RFID Data Sets," *Proceedings of the 22nd International Conference on Data Engineering*, Atlanta, GA.
- R. Sandhu and D. Klabjan (2004), "Integrated Airline Planning," *Proceedings of TRISTAN V*.
- D. Klabjan (2002), "A New Subadditive Approach to Integer Programming: Theory and Algorithms," *Proceedings of the 9th Integer Programming and Combinatorial Optimization Conference*, 384-400.
- D. Klabjan and K. Schwan (2001), "Airline Crew Pairing Generation in Parallel," *Proceedings of the 10<sup>th</sup> SIAM Conference on Parallel Processing for Scientific Computing*.
- D. Klabjan, A. Schaefer, E.L. Johnson, A. Kleywegt, and G.L. Nemhauser (2001), "Robust Airline Crew Scheduling," *Proceedings of TRISTAN IV*, 275-280.

## Submitted Manuscripts

- Y. Jiang, N. DeHoratius and D. Klabjan (2012), Inventory Management with Purchase Order Errors and Rework.
- F. Schneider and D. Klabjan (2011), Inventory Control for Products with Added-value using Radio Frequency Identification.
- D. Klabjan and D. Yang (2011), Optimal Placement of Reconfigurable Optical Add/Drop Multiplexers with Packing, Blocking, and Signal Loss.
- C. Almeder, D. Klabjan, and B. Almada-Lobo (2011), Lead Time Considerations for the Multi-Level Capacitated Lot-sizing Problem.
- Seth, D. Klabjan and P. Ferreira (2009), Analyses of Advanced Iterated Tour Partitioning Heuristics for Generalized Vehicle Routing Problems.
- Seth, D. Klabjan and P. Ferreira (2009), A Novel Local Search Integer-Programming-Based Heuristic for PCB Assembly on Collect-and-Place Machines.
- L. Li, C.S. Pun, D Klabjan (2011), Single Item Lot-Sizing Problem with Minimum Order Quantity.
- J. Ahn, O. de Weck, Y. Gang and D. Klabjan (2011), The Generalized Location Routing Problem with Profits.
- O. de Weck, D. Klabjan, C. Taylor, D. Simchi-Levi, J. Ahn, E. Gralla, S. Shull (2008), Interplanetary Supply Chain Management and Logistics at NASA.
- Kim, D. Klabjan and D. Simchi-Levi (2008), Optimal Expediting Policies for an Inventory System with Stochastic Lead Time under Radio Frequency Identification.
- M. Song, D. Klabjan, D. Simchi-Levi (2010), Robust Stochastic Lot-sizing by Means of Histograms.
- C. Kim, D. Klabjan, and D. Simchi-Levi (2009), Optimal Policy for Expediting Orders in Transit.

## Technical Reports (to be submitted)

- Y. Jiang and D. Klabjan, Business-to-Consumer Single Period Fulfillment Strategies.
- M. Bundschuh, D. Klabjan, P. Pei, and D. Thurston, Modeling Robust and Reliable Supply Chains.
- Seth, D. Klabjan and P. Ferreira, Assembly Optimization for High-Volume High-Flexibility Robotic PCB Assembly.
- D. Klabjan, Algorithms for Lot Sizing with Supplier Selection.
- N. Halman, D. Klabjan, C-L. Li, J. Orlin and D. Simchi-Levi, Fully Polynomial Time Approximation Schemes for Convex and Monotone Stochastic Dynamic Programming.
- D. Klabjan, Economic Order Quantity for Business-to-Consumer Fulfillment.
- S. Shebalov and D. Klabjan, Lifting for Mixed Integer Programs with Variable Upper Bounds.

## Magazine Publications

- C. Taylor, M. Song, D. Klabjan, O. de Weck, D. Simchi-Levi, A Mathematical Model for Interplanetary Logistics, *Logistics Spectrum* 41 (2007), Issue 1, January-March, pages 23-33.

- D. Klabjan, R. Joshi, Harvesting Smart Grid Benefits, *M2M* (2009), September-October, page 40.

## Grants and Contracts

- IBM Faculty Award, PI Diego Klabjan, IBM (October 2011-October 2112, \$40,000)
- Analytics from Pricing to Sourcing, co-PI Diego Klabjan, *Echo Global Logistics* (July 2011-January 2012, \$150,000)
- Evaluation of Airline Capacity Models, PI Diego Klabjan, *Sabre Holdings* (March 2011-June 2011, \$15,000)
- Information System for Infrastructure Deployment in Support of Future Vehicles, PI Diego Klabjan, *Department of Transportation* and *LogicBlox LLC* (July 2010 – June 2011, \$105,000)
- Sustainable Supply Chain Design for Remote Locations, PI Diego Klabjan, *NSF* (September 2009 – December 2011, \$202,469)
- Renewable Portfolio Selection, PI Diego Klabjan, *General Motors* and *Institute of Sustainability and Environment* (June 2010 – June 2011, \$65,000)
- Freight Index, PI Diego Klabjan, *Ryder Systems* (March 2010-October 2010, \$100,000)
- Cargo Revenue Management, PI Diego Klabjan, *JDA Software* (December 2009-June 2010, \$48,000)
- Wavelength Cost Optimization Tool, PI Diego Klabjan, *Level 3 Communication LLC* (September 2009-December 2009, \$25,000)
- Integrated Airline Recovery, PI Diego Klabjan, *Sabre Holdings* (June 2008-June 2009, \$80,000)
- Strategic Gang Scheduling, PI Diego Klabjan, *Department of Transportation – CCITT* (August 2009-August 2010, \$70,000)
- Business Intelligence for FUM-to-DCC Conversion, PI Diego Klabjan, *Ryder Systems Inc.* (September 2008-September 2009, \$80,000)
- Consolidation in Logistics, PI Diego Klabjan, *W.W. Grainger* (September 2008-December 2008, \$30,000)
- Business Intelligence in Retailing, PI Diego Klabjan, *Predictix Inc.* (June 2008-December 2009, \$120,000)
- Algebraic Modeling in DataLog, PI Diego Klabjan, *LogicBlox Inc.* (June 2008-June 2010, \$52,000)
- Approximate Dynamic Programming in Complex Multi-Echelon Inventory and Production Systems, PI Diego Klabjan, *NSF* (August 2007 – August 2011, \$238,019)
- Highway Maintenance Staffing Levels, co-PI Diego Klabjan, *Illinois Department of Transportation* (June 2006-September 2006, \$30,000)
- Regional Data Archiving and Management, PI Diego Klabjan, *Illinois State Toll Highway Authority* and *Illinois Department of Transportation* (August 2005-March 2007, \$150,000)
- Intra Market Optimization, PI Diego Klabjan, *FedEx Express* (August 2005-August 2006, \$50,000)
- One-to-one Marketing with RFID, PI Diego Klabjan, *Intel* (August 2002 – August 2003, \$10,000)
- Robust Airline Crew Scheduling: Move-up Crews, PI Diego Klabjan, *NSF* (August 2000 – August 2003, \$174,244)
- Duality in Integer Programming, PI Diego Klabjan, *NSF* (August 2003 – August 2006, \$203,020)
- Next Generation Crew Pairing Optimization, PI Diego Klabjan, *Sabre Holdings* (August 1999-August 2001, \$60,000)
- Multi-unit Library Budget Allocation, PI Diego Klabjan, *University of Illinois Library System* (August 2000 – August 2020, \$30,000)
- Crew Scheduling with Regularity, PI Diego Klabjan, *University of Illinois Research Board* (August 1999-August 2000, \$30,000)

## Academic Invited Lectures

- *University of Chicago*, Booth School of Business (2011)
- *Illinois Institute of Technology*, Applied Mathematics (2009)
- *University of Colorado, Boulder*, School of Business (2008)
- *Texas A&M*, Industrial and Systems Engineering (2008)
- *Northwestern University*, Kellogg School of Management (2008)
- *Fields Institute*, McMaster University (2007)
- *Ohio State University*, Integrated Systems Engineering (2007)
- *University of Wisconsin*, Industrial Engineering (2007)

- MIT, OR Center Seminar Series (2006)
- University of Illinois at Urbana-Champaign, Department of Aerospace Engineering (2006)
- Cornell University, Operations Research (2006)
- Stanford, Management Science and Engineering (2004)
- Princeton University, Operations Research (2004)
- University of Michigan, Industrial and Operations Engineering (2003)
- University of California, Berkeley, Civil and Environmental Engineering Seminar Series (2002)
- MIT, OR Center Seminar Series (2001)
- SUNY Buffalo, Industrial Engineering (2000)
- University of Chicago, Graduate School of Business (2000)
- Georgia Institute of Technology, Industrial and System Engineering (2000)

## Corporate Invited Lectures

- FHWA, Freight & Carbon Footprint: Efforts to Enhance Supply Chain Sustainability, September 2010. (<http://www.fhwa.dot.gov/freightplanning/talking.htm>)
- Ford, R&D (2010)
- United Airlines, Enterprise Optimization (2008)
- Sabre Holdings, The Research Group (2007)
- O'Hare Airport, O'Hare Modernization Program (2007)
- Sears Holdings, Panelist of experts on Logistics Business Practices for Home Delivery (2007)
- FedEx Express, R&D (2006)
- RiverGlass Inc., R&D (2005)
- Motorola, R&D (2005)
- Caleb Technologies Corp., R&D (2004)
- SBS International, R&D (2003)
- American Airlines, Operations Research (2003)

## Featured Speaker at Conventions

- Speaker at SmartEnergy International, San Jose, 2010.
- Panelist on Radio Frequency Identification; Machine-to-Machine Convention, Chicago, 2009.
- Panelist on Methodological Rigor and Practical Relevancy, What are We Missing?; Supply Chain Management Educators' Conference, organized by Council of Supply Chain Management Professionals, Chicago 2009.
- Speaker at RFID Live, Orlando, FL (2007)
- Speaker at EPC Connection, Chicago, IL (2007)

## Quoted and Interviewed in Magazines and Newspapers

- Supplying the Moon and Earth, Forbes.com (2006)
- 'They wasted my day': Glitch grounds United flights 2 hours, Chicago Sun-Times (2007)
- Smart Meter Fact and Fiction, M2M (2009)
- Using analytics to do more than crunch data, OGE plans to use the whole brain rather than separate neurons, Intelligent Utility, March/April (2011)

## Activities

- Department Editor of Design and Manufacturing, *IIE Transactions*
- Former President, INFORMS Aviation Section
- Memberships

- Institute for Operations Research and the Management Sciences
- Mathematical Optimization Society
- Institute of Industrial Engineers
- Alfred Sloan Foundation
- Founding member of Industry Studies Association
- IEEE

Associate Editor

- *Naval Research Logistics*
- *Operations Research* (Area of Optimization)
- *Operations Research* (Area of Transportation)
- *IIE Transactions*
- Advisory Board member, INFORMS Practice meeting (2009,2010,2011)
- Main Organizer
  - Workshop: Innovation in Big Data Analytics, San Jose, CA (2012)
  - Workshop: The Greening of Transportation, Evanston, IL (2009)
  - Workshop: Business Intelligence in Transportation, Evanston, IL (2009)
  - Fall INFORMS Meeting Cluster Chair: Scheduling in the Service Sector, Washington DC (2008)
- Evanston Mayor's Wind Farm Committee