

# MIKHAIL S. NEDIAK

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## EDUCATION

**Ph.D., Operations Research**, October 2002

Thesis title: *Convexity Cuts and Integrality Merit Functions for Mixed-Integer Programming*

**M.Sc., Computer Science**, May 2002

Rutgers, The State University of New Jersey, RUTCOR, Piscataway, New Jersey, USA

**M.Sc. with honours, Applied Mathematics**, June 1997

Thesis title: *Study of a Model of Consumption of Durable Goods*

**B.Sc. with honours, Natural Sciences**, June 1995

Moscow Institute of Physics and Technology, Department of Management and Applied Mathematics, Moscow, Russia

## EXPERIENCE

**Smith School of Business**, Queen's University, Kingston, Ontario, Canada

*Associate Director, Research*, Scotiabank Centre for Customer Analytics, February 2016 – present

*Associate Professor*, July 2015 – present (*Assistant Professor*, July 2004 – June 2015)

- B.Com. courses taught: "Business Decision Models II", "Advanced Business Decision Models", "Introduction to Mathematical Analysis for Management"
- M.Sc./PhD courses taught: "Deterministic Models in Operations Research", "Stochastic Models in Operations Research", "Optimization Theory"
- Master of Management Analytics courses taught: "Big Data"

**Department of Mathematics and Statistics**, McMaster University, Hamilton, Ontario, Canada

*SHARCNET Postdoctoral Fellow*, August 2002 – June 2004

- Courses taught: "Design of Experiments and Regression", "Introductory Computer-Aided Statistics", "Stochastic Processes"

**Department of Management Science and Information Systems, School of Business**

Rutgers, The State University of New Jersey, Piscataway, New Jersey, USA

*Part-time Lecturer*, September 1999 – December 2000

- Courses taught: "Business Applications of Structured Programming", "Computer Technology", "Advanced Operations Management"

**Rutgers Center for Operations Research**

Rutgers, The State University of New Jersey, Piscataway, New Jersey, USA

*Graduate Assistant*, September 1997 – June 2002

## AWARDS

NSERC Discovery Grant 2007-2009 (Group – with J. McGill and T. Levina)

QSB New Researcher Achievement Award 2008

Co-winner of COIN-OR INFORMS Cup 2009 (with T. Levina, Y. Levin, J. McGill and H. Topaloglu)

NSERC Discovery Grant 2011-2016 (Group – with J. McGill and T. Levina)

Co-winner of 2013 INFORMS Revenue Management & Pricing Practice Prize, Atlanta, June 6, 2013 (with J. McGill, Y. Levin, Pricing Solutions, and Molson Coors)

Toller Family Fellow of Operations Management 2014-2017

QSB Research Achievement Award 2015

MITACS Accelerate Grant 2016-2018 (with Y. Levin)

## PUBLICATIONS

*Published:*

- [1] "Strategic Consumer Cooperation in a Name-Your-Own-Price Channel", *Production and Operations Management*, 24 (2015), no. 12, 1883-1900 (with Tanya Levin, Yuri Levin, and Jeff McGill)
- [2] "Scalable Dynamic Bid Prices for Network Revenue Management in Continuous Time", *Production and Operations Management*, 24 (2015), no. 10, 1621-1635 (with Samuel Kirshner)
- [3] "Quantity Premiums and Discounts in Dynamic Pricing", *Operations Research*, 62 (2014), no. 4, 846-863 (with Yuri Levin and Andrei Bazhanov)
- [4] "Cargo Capacity Management with Allotments and Spot Market Demand", *Operations Research* 60 (2012), no. 2, 351-365 (with Yuri Levin and Huseyin Topaloglu)
- [5] "Network Cargo Capacity Management", *Operations Research*, 59 (2011), no. 4, 1008-1023 (with Tanya Levina, Yuri Levin and Jeff McGill)
- [6] "Weak Aggregating Algorithm for the Distribution-Free Perishable Inventory Problem", *Operations Research Letters*, 38 (2010), 516-521 (with Tanya Levina, Yuri Levin, Jeff McGill and Vladimir Vovk)
- [7] "Optimal Dynamic Pricing of Perishable Items by a Monopolist Facing Strategic Consumers", *Production and Operations Management*, 19 (2010), no. 1, 40-60 (with Yuri Levin and Jeff McGill)
- [8] "Dynamic Pricing in the Presence of Strategic Consumers and Oligopolistic Competition", *Management Science*, 55 (2009), no. 1, 32-46 (with Yuri Levin and Jeff McGill)
- [9] "Dynamic Pricing with Online Learning: Application to Markets with Strategic Consumers", *Operations Research*, 57 (2009), no. 2, 327-341 (with Tanya Levina, Yuri Levin and Jeff McGill)
- [10] "Counteracting Strategic Consumer Behavior in Dynamic Pricing Systems", Chapter 12 in S. Netessine, and C. S. Tang (eds.), *Consumer-Driven Demand and OM Models*, Springer, 2009, 323-352 (with Yossi Aviv and Yuri Levin)
- [11] "Risk in Revenue Management and Dynamic Pricing", *Operations Research*, 56 (2008), no. 2, 326-343 (with Yuri Levin and Jeff McGill)
- [12] "Fréchet Optimal Bounds on the Probability of a Union with Supplementary Information", *Statistics and Probability Letters*, 78 (2008), no. 3, 311-319 (with Fred Hoppe)
- [13] "Price guarantees in Dynamic Pricing and Revenue Management", *Operations Research*, 55 (2007), no. 1, 75-97 (with Yuri Levin and Jeff McGill)
- [14] "Linear Programming with Online Learning", *Operations Research Letters*, 35 (2007), 612-618 (with Tanya Levina, Yuri Levin and Jeff McGill)
- [15] "Pivot, cut, and dive: a heuristic for 0-1 mixed integer programming", *Journal of Heuristics*, 13 (2007), 471-503 (with Jonathan Eckstein)
- [16] "Dynamic Pricing with Online Learning of General Reservation Price Distribution", in *Proceedings of INCOM 2006: 12th IFAC Symposium on Information Control Problems in Manufacturing* (with Tanya Levin, Yuri Levin and Jeff McGill)
- [17] "Depth-optimized convexity cuts", *Annals of Operations Research*, 139 (2005), 95-129 (with Jonathan Eckstein)
- [18] "Optimal on-line calibration of testlets", in Martijn P. Berger, Weng Kee Wong (eds.), *Applied Optimal Design*, Wiley, 2005, 21-43 (with Douglas H. Jones)
- [19] "Planar case of the maximum box and related problems", *Proceedings of the 15<sup>th</sup> Canadian Conference on Computational Geometry (CCCG'03)*, 14-18 (with Ying Liu)
- [20] "A direct Newton method for calculus of variations", *Journal of Computational and Applied Mathematics*, 139 (2002), no. 2, 197-213 (with Yuri Levin and Adi Ben-Israel)

- [21] “The maximum box problem and its application to data analysis”, *Computational Optimization and Applications*, 23 (2002), 281-294 (with Jonathan Eckstein, Peter L. Hammer, Ying Liu and Bruno Simeone)
- [22] “Conditions for the integrability of demand functions for durable goods”, (in Russian), *Mathematical Modeling*, 9 (1997), no. 8, 70-82
- [23] “Turnpike theorem for a model of consumption of non-durable and durable goods”, (in Russian, English), *Proceedings of the First Moscow International Conference on Operations Research*, Moscow, April 10-13, 1996, 145-150

*Submitted:*

- [24] “Quantity Competition in the Presence of Strategic Consumers” (with Andrei Bazhanov and Yuri Levin)
- [25] “Timing Product Upgrades with Stochastic Technological Advancements, Brand Commitment, and Pent-Up Demand” (with Samuel Kirshner and Yuri Levin)
- [26] “Dynamic Pricing of Flight Passes” (with Yuri Levin and Jue Wang)
- [27] “Price-Matching Competition in the Presence of Strategic Consumers” (with Yossi Aviv, Andrei Bazhanov and Yuri Levin)
- [28] “Efficient, Optimal, Operations Management in the Presence of Liquid Financial Forward Markets” (with Matt Thompson, Eric Shiu, and Yuri Levin)
- [29] “Multi-Product Exchange Markets with Dynamic Consumer Preference” (with Samuel Kirshner and Yuri Levin)

*Research reports:*

- [30] “Finding intersection curves of surfaces via directional Newton method”, RUTCOR Research Report 60-2000 (with Yuri Levin and Adi Ben-Israel)
- [31] “Item parameter calibration of LSAT items using MCMC approximation of Bayes posterior distributions”, RUTCOR Research Report 7-2000 (with Douglas H. Jones)
- [32] “Sequential optimal designs for on-line item calibration”, RUTCOR Research Report 2-99 (with Douglas H. Jones and Xiang-Bo Wang)

*Work in progress:*

- [33] “Dynamic Pricing and Social Media Management” (with Tatsiana Levina, Yuri Levin, and Jue Wang)
- [34] “Dynamic Equilibrium in the Presence of Strategic Customers” (with J. Wang and Y. Levin)
- [35] “Revenue Management Approach to Student Selection” (with D. Brady and J. McGill)
- [36] “Bayesian approach to a Sign Testing problem” (with Fred Hoppe)
- [37] “Dynamic Pricing for Stochastic Network Sea Container Management with Allotments” (with C.T. Ng, M. Kovalyov, and Y. Levin)

## **CONFERENCE PRESENTATIONS**

- “Turnpike Equilibrium for Oligopolistic Dynamic Pricing Competition with Strategic Consumers” (with Jue Wang and Yuri Levin) INFORMS 2015 Annual Meeting, Philadelphia, USA, Nov 1-4
- “Selling Passes To Strategic Customers” (with Jue Wang and Yuri Levin), 2015 INFORMS Revenue Management and Pricing Section Conference, Columbia University, New York, USA, June 11-12 and 2015 MSOM Conference, June 29-30
- “A Non-parametric Approach To Dynamic Pricing With Demand Learning” (with Guyves Ahtari and Yuri Levin), CORS/INFORMS 2015 Joint International Meeting, Montreal, QC, June 14-17 and INFORMS 2015 Annual Meeting, Philadelphia, USA, Nov 1-4

“Capacity and Price-Matching Competition with Strategic Consumers” (with Yossi Aviv, Andrei Bazhanov, and Yuri Levin) CORS/INFORMS 2015 Joint International Meeting, Montreal, QC, June 14-17 and INFORMS 2015 Annual Meeting, Philadelphia, USA, Nov 1-4

“Quantity Competition in a Multi-Product Exchange Market with Dynamic Consumer Preferences” (with Sam Kirshner and Yuri Levin), CORS/INFORMS 2015 Joint International Meeting, Montreal, QC, June 14-17, 2015 MSOM Conference, June 29-30, and INFORMS 2015 Annual Meeting, Philadelphia, USA, Nov 1-4

“Dynamic Pricing with Social Learning and Risk-Sensitive Consumers” (with Jue Wang, Tanya Levin, and Yuri Levin), CORS/INFORMS 2015 Joint International Meeting, Montreal, QC, June 14-17

“Quantity Competition in the Presence of Strategic Consumers” (with Andrei Bazhanov and Yuri Levin); CORS Annual Meeting, Ottawa, ON, May 26-28, 2014; IFORS, Barcelona, Spain, July 13-18, 2014; INFORMS Annual Meeting, San Francisco, CA, USA, November 9-11, 2014

“Quantity and Price-Matching Competition in the Presence of Strategic Consumers” (with Yossi Aviv, Andrei Bazhanov, Yuri Levin); QSB Research Forum, October 28, 2014

“The timing of product upgrades with brand loyalty and demand aggregation” (with Sam Kirshner and Yuri Levin); CORS Annual Meeting, Ottawa, ON, May 26-28, 2014; IFORS, Barcelona, Spain, July 13-18, 2014 (S. Kirshner presenter)

“Quantity Competition in a Multi-Product/Multi-Consumer Exchange Market” (with Sam Kirshner and Yuri Levin); CORS Annual Meeting, Ottawa, ON, May 26-28, 2014

“Dynamic Pricing with Risk-Sensitive Consumers and Social Learning” (with Tanya Levin, Mikhail Nediak and Jue Wang); IFORS, Barcelona, Spain, July 13-18, 2014 (T. Levin presenter); INFORMS Annual Meeting, San Francisco, CA, USA, November 9-11, 2014 (M. Nediak presenter)

“Product Upgrade Timing with Stochastic Technology Improvements and Brand Loyalty” (with Sam Kirshner and Yuri Levin); INFORMS Annual Meeting, Minneapolis, October 6-9, 2013

“Dynamic pricing with strategic consumers and social learning” (with Yuri Levin); 26th EURO-INFORMS Joint International Conference, Rome, July 1-4, 2013; 13th Annual INFORMS Revenue Management & Pricing Conference, Atlanta, June 6-7, 2013

“Pricing and Promotions Analysis at Molson Coors Brewing Company” (with J. McGill, Y. Levin, Pricing Solutions, Ltd. and Molson Coors, Inc.); 2013 INFORMS Revenue Management & Pricing Price Presentation, Atlanta, June 6, 2013

“Selling Passes to Strategic Consumers using Dynamic Pricing” (with Y. Levin and H. Topaloglu); INFORMS Revenue Management and Pricing Conference RM-12, Berlin, Germany, June 29-30, 2012; CORS Annual Meeting, Niagara Falls, ON, June 11-13, 2012; INFORMS Annual Meeting, Phoenix, AZ, October 14-17, 2012; EURO XV Conference, Vilnius, Lithuania, July 8-9, 2012

“Name-Your-Own-Price sales channels: Can strategic consumers improve their performance with information exchange or collaboration?” (with T. Levina, Y. Levin, J. McGill), EURO XV Conference, Vilnius, Lithuania, July 8-9, 2012

“Dynamic Nonlinear Pricing of Perishable Items” (with Y. Levin); INFORMS Revenue Management and Pricing Conference RM-11, Columbia University, June 23-24, 2011; CORS Annual Meeting, Halifax, NS, May 30-June 1, 2011; INFORMS Annual Meeting, Charlotte, NC, November 11-14, 2011

“A revenue management approach to student selection and scholarship allocation” (with D. Brady and J. McGill) CORS Annual Meeting, Halifax, NS, May 30-June 1, 2011

“Introduction to Dynamic Pricing and Revenue Management”, invited talk at United Institute of Informatics Problems of National Academy of Sciences of Belarus; Minsk, Belarus, September 8, 2011.

“Can Strategic Consumers Benefit from Cooperation and Information Exchange?” (with T. Levina, Y. Levin, J. McGill); INFORMS Revenue Management and Pricing Conference RM-10, Cornell University, June, 2010; 24th European Conference on OR (EURO XXIV), Lisbon, Portugal, July 11-14, 2010 (Y. Levin presenter)

“Strategic Bidders Club: Implications for Consumer Learning” (with T. Levina, Y. Levin, J. McGill), MSOM conference (refereed), Haifa, Israel, June 28-29, 2010; EURO XXIV, Lisbon, Portugal, July 11-14, 2010

“Cargo Revenue Management with Flight Combination Allotments and Consumer Choice Behavior” (with Y. Levin and H. Topaloglu), INFORMS Annual Meeting, San Diego, October 11-14, 2009

“Aggregating Algorithm for Pricing and Capacity Planning under Uncertain Demand” (with Tanya Levin, Yuri Levin, Jeff McGill, and V.Vovk), Joint International Meeting of CORS-INFORMS, Toronto, June 14-17, 2009; 23d European Conference on OR (EURO XXIII), Bonn, Germany, July 5-8, 2009; INFORMS Annual Meeting, San Diego, October 11-14, 2009

“Competitive Dynamic Pricing with Guarantees in the Presence of Strategic Consumers” (with Y. Aviv and Y. Levin), Eights Annual Revenue Management and Pricing Conference, Montreal, June 18-20, 2008; Joint Conference of CORS and Optimization Days, Quebec City, May 12-14, 2008; INFORMS Annual Meeting, Washington DC, October 11-14, 2008; 23d European Conference on OR (EURO XXIII), Bonn, Germany, July 5-8, 2009

“Cargo Revenue Management with Allotments and Spot Market Demand” (with Y. Levin and H. Topaloglu), Eights Annual Revenue Management and Pricing Conference, Montreal, June 18-20, 2008, Joint Conference of CORS and Optimization Days, Quebec City, May 12-14, 2008, INFORMS Annual Meeting, Washington DC, October 11-14, 2008

“Dynamic Capacity Allocation and Pricing under Competition” (with H. Jiang and Y. Levin), Eights Annual Revenue Management and Pricing Conference, Montreal, June 18-20, 2008, INFORMS Annual Meeting, Washington DC, October 11-14, 2008

“Generalized Nash Games and their Applications in Pricing” (with H. Jiang, Y. Levin, and J. McGill), Eights Annual Revenue Management and Pricing Conference, Montreal, June 18-20, 2008

“The State of Research in Air Cargo Capacity Management”. Invited talk. Rotman School of Management, University of Toronto, March 2008.

“Cargo Capacity Management on a Network” (with T. Levin, Y. Levin and J. McGill), CORS Annual Meeting, London, May 13-16, 2007; 22nd European Conference on OR (EURO XXII), Prague, Czech Republic, July 8-11, 2007; Seventh Annual Revenue Management and Pricing Conference, Barcelona, Spain, June 28-29, 2007; INFORMS Annual Meeting, Seattle, November 4-7, 2007.

“Derivative-free Optimization in Revenue Management” (with T. Levin, Y. Levin and J. McGill), Second MPS International Conference on Continuous Optimization, Hamilton, August 13-16, 2007

“Dynamic pricing with online learning of general reservation price distribution” (with T. Levin, Y. Levin and J. McGill), 12th IFAC Symposium on Information Control Problems in Manufacturing (INCOM 2006), Saint-Etienne, France, May 17-19, 2006

“Online learning for dynamic pricing in the presence of strategic consumers” (with T. Levin, Y. Levin and J. McGill), Joint Conference of CORS and Optimization Days, Montreal, May 8-10, 2006; INFORMS International Conference, Hong Kong, June 25-28, 2006

“Dynamic Pricing in the Presence of Strategic Consumers and Oligopolistic Competition” (with Y. Levin and J. McGill), Joint Conference of CORS and Optimization Days, Montreal, May 8-10, 2006; Sixth Annual Revenue Management and Pricing Conference, Columbia University, New York, June 5-6, 2006; 21st European Conference on Operational Research (EURO XXI), Iceland, July, 2006

“Dynamic pricing with online learning and strategic consumers” (with T. Levin, Y. Levin and J. McGill), INFORMS Annual Meeting, Pittsburgh, November 5-8, 2006

“Risk in Revenue Management and Dynamic Pricing” (with Y. Levin and J. McGill), INFORMS Annual Meeting, Pittsburgh, November 5-8, 2006

“Dynamic Pricing with Online Learning and Strategic Consumers” (with Tanya Levin, Yuri Levin and Jeff McGill), INFORMS Joint National Conference, San Francisco, November 2005

“A strategic consumer response to dynamically priced products” (with Yuri Levin and Jeff McGill), IFORS Hawaii, July 2005

“Dynamic Pricing with Online Learning and Strategic Consumers” (with Tanya Levin, Yuri Levin and Jeff McGill), Canadian Operational Research Society (CORS) National Conference, Halifax, May 2005

“New Developments in Dynamic Pricing and Revenue Management” (with Yuri Levin and Jeff McGill), invited seminar, Lehigh University, Industrial and Systems Engineering Department, Spring Seminar series, April, 2005

“Price Guarantees in Dynamic Pricing and Revenue Management” (with Yuri Levin and Jeff McGill), 5th Annual MOPTA Conference, University of Windsor, July 25-27, 2005

“New Developments in Dynamic Pricing and Revenue Management” (with Jeff McGill and Mikhail Nediak), Queen’s School of Business, Research Seminar series, February, 2005

“Price Guarantees in Dynamic Pricing and Revenue Management” (with Yuri Levin and Jeff McGill, invited paper), INFORMS Annual Meeting, Denver, October 24-27, 2004

“Optimal Convexity Cut Generation for Mixed-Integer Programming” (with Jonathan Eckstein), 3rd Annual McMaster Optimization Conference (MOPTA 03), July 30-August 1, 2003, Hamilton

“Depth-Optimized Convexity Cuts for Mixed-Integer Programming” (with Jonathan Eckstein), CORS 2003 Annual Meeting, June 2-4, 2003, Vancouver

“Integrability of Demand Functions for Durable Goods”, Applied and Industrial Mathematics Seminar, McMaster University, January 14, 2003, Hamilton

“A Parallel Pivot, Cut, and Dive Heuristic for MIP” (with Jonathan Eckstein), SIAM Conference on Optimization, 2002, May 19-21, 2002, Toronto

“A Parallel General Purpose Heuristic for Mixed 0-1 Integer Programming” (with Jonathan Eckstein), INFORMS 2001 Annual Meeting, November 4-7, 2001, Miami Beach, Florida

“A Parallel General Purpose Heuristic for Mixed 0-1 Integer Programming” (with Jonathan Eckstein), 18th European Conference on Operations Research, July 9-11, 2001, Rotterdam, the Netherlands