

# SELVAPRABU (SELVA) NADARAJAH

College of Business Administration ◊ University of Illinois at Chicago

601 S. Morgan Street ◊ Chicago IL 60607

selvan@uic.edu

<http://selvan.people.uic.edu>

## EDUCATION

---

**Tepper School of Business, Carnegie Mellon University** *May 2014*

PhD in Operations Research

Minor in Operations Management

**Thesis:** Merchant operations of commodity and energy conversion assets

**Advisor:** Prof. Nicola Secomandi (Operations Management, Tepper)

**Tepper School of Business, Carnegie Mellon University** *May 2011*

Master of Science in Operations Research

**Department of Management Sciences, University of Waterloo** *Aug 2008*

Master of Applied Sciences in Operations Research

Advisor: Prof. James H. Bookbinder

**Department of Aerospace Engineering, Indian Institute of Technology Madras** *Jul 2006*

Bachelor of Technology in Aerospace Engineering

Minor in Operations Research

## ACADEMIC APPOINTMENTS

---

**Assistant Professor of Operations Management** *August 2014 - Present*

Information and Decision Sciences Department

College of Business Administration

University of Illinois at Chicago, Chicago, USA

## RESEARCH INTERESTS

---

- Energy operations with focus on commodity and energy conversion assets (e.g., natural gas storage, power plants, and oil refineries), including renewable energy (e.g., wind)
- Solution of large scale dynamic optimization problems using math programming and first-order approaches to approximate dynamic programming
- Revenue management in the hospitality (e.g. hotels) and retail sectors

## HONORS AND AWARDS

---

- William L. Cooper doctoral dissertation award in Management Sciences or Management, Carnegie Mellon University *2014*
- Egon Balas best student paper award, Carnegie Mellon University *2013*
- William Larimer Mellon fellowship, Carnegie Mellon University *2009*
- Innovations in SCM track best paper award, ISDSI conference *2008*
- Teaching assistant award, Management Sciences, University of Waterloo *2007*
- Finalist, Canadian Operational Research Society simulation competition *2007*
- Merit scholarship, Faculty of Engineering, University of Waterloo *2006*

- International Students Masters award, University of Waterloo 2006
- Graduate entrance scholarship, University of Waterloo 2006
- Best student paper award, National Aerospace Symposium, India 2006

## **PUBLICATIONS**

---

### Published/Forthcoming

- Merchant energy trading in a network (with N. Secomandi). *Operations Research*, Forthcoming, 2017.
- Relationship between least squares Monte Carlo and approximate linear programming (with N. Secomandi). *Operations Research Letters*, 45(5), 2017.
- Comparison of least squares Monte Carlo methods with applications to energy real options (with F. Margot and N. Secomandi). *European Journal of Operational Research*, 256(1), 2017.
- Relaxations of approximate linear programs for the real option management of commodity storage (with F. Margot and N. Secomandi). *Management Science*, 61(12), 2015.
- Real option management of hydrocarbon cracking operations (with N. Secomandi, G. Sowers, and J. Wassick). *Real Options in Energy and Commodity Markets*, Now publishers, 2017.
- An integrated approach to the less-than-truckload carrier collaboration problem (with J. H. Bookbinder). *Journal of Heuristics*, 19(6), 2013.

### Submitted

- Managing shutdown risk in merchant commodity and energy production (with A. Trivella, S.E. Fleten, D. Mazieres, D. Pisinger).
- Revisiting approximate linear programming using a saddle point based reformulation and root finding solution approach (with Q. Lin and N. Soheili).
- Network-based approximate linear programming for discrete optimization (with A. Cire).
- A level-set method for convex optimization with a feasible solution path (with Q. Lin and N. Soheili).
- Dynamic pricing for hotel rooms when customers request multiple-day stays (with Y. F. Lim and Q. Ding).
- Partial hyperplane activation for generalized intersection cuts (with A. Kazachkov, E. Balas, and F. Margot)

### Conference Proceedings

- Operation, valuation, and electricity sourcing for a generic Aluminium smelter (with S. H. Andresen, E. F. Aas, S. E. Fleten, D. Mazieres), Real options workshop 2015, Lappeenranta, Finland.
- A three-echelon integrated production-distribution system (with J. H. Bookbinder). *The International Conference on Decision Sciences and Technology for Globalization*, Decision Sciences Institute, Ghaziabad, India, 2008.
- Enhancing transportation efficiencies through carrier collaboration (with J. H. Bookbinder). *Business Process Council World Conference*, Mumbai, India, 2007.
- Non-destructive evaluation by low pulsing acoustic tap technique: Spectral relationships (with T.S. Niranjana and A.V. Varun). *Flight 2006*, National Aerospace Symposium, Chennai, India, 2006.

## SELECTED TALKS

---

- Revisiting approximate linear programming using a saddle point based reformulation and root finding solution approach
  - INFORMS Annual Meeting, Nashville, TN, 2017
- Network-based approximate linear programming for discrete optimization
  - INFORMS Annual Meeting, Nashville, TN, 2017
- Managing shutdown risk in commodity and energy production
  - INFORMS Annual Meeting, Nashville, TN, 2016
- Merchant energy trading in a network
  - INFORMS Annual Meeting, Houston, TN, 2017
  - MSOM iFORM SIG conference, University of North Carolina, NC, 2017
  - INFORMS Annual Meeting, Nashville, TN, 2016
  - MSOM Annual Conference, University of Auckland, New Zealand, 2016
  - POMS Annual Conference, Orlando, FL, 2016
  - Rotman School of Management, University of Toronto, Toronto, ON, 2016
  - INFORMS Optimization Society Conference, Princeton University, NJ, 2016
  - INFORMS Annual Meeting, San Francisco, CA, 2014 (earlier version under the title “Tradeoff between storage and transport in merchant energy trading on a network”)
  - INFORMS Annual Meeting, Minneapolis, MN, 2013 (earlier version under the title “Joint merchant management of natural gas storage and transport assets”)
- Relationship between least squares Monte Carlo and approximate linear programming
  - Booth School of Business, University of Chicago, Chicago, IL, 2015
  - Fuqua School of Business, Duke University, Durham, NC, 2015
  - INFORMS Annual Meeting, Philadelphia, PA, 2015
  - International symposium on mathematical programming, Pittsburgh, PA, 2015 (earlier version under the title “Connections between least squares Monte Carlo and math programming based approximate dynamic programming”)
  - INFORMS Annual Meeting, San Francisco, CA, 2014 (earlier version under the title “Connections between least squares Monte Carlo and math programming based approximate dynamic programming”)
- Relaxations of approximate linear programs for the merchant management of commodity and energy conversion assets
  - Darden Business School, University of Virginia, VA, 2014
  - Department of Management Sciences, University of Waterloo, ON, Canada, 2014
  - Lee Kong Chian School of Business, Singapore Management University, Singapore, 2013
  - Industrial and Systems Engineering, University of Minnesota, MN, 2014
  - Jindal School of Management, University of Texas at Dallas, TX, 2014

- Kelley School of Business, Indiana University, IN, 2014
- Kenan-Flagler Business School, University of North Carolina at Chapel Hill, NC, 2014
- Liautaud Graduate School of Business, University of Illinois at Chicago, IL, 2014
- London Business School, London, United Kingdom, 2014
- Queens School of Business, Queen’s University, ON, Canada, 2014
- Singapore University of Technology and Design, Singapore, 2014
- Relaxations of approximate linear programs for the real option management of commodity storage
  - INFORMS Annual Meeting, Minneapolis, MN, 2013
  - MSOM Annual Conference, INSEAD, Fontainebleau, France, 2013
  - Modeling and Optimization: Theory and Applications (MOPTA), Lehigh University, Bethlehem, PA, 2013
  - POMS Annual Meeting, Denver, CO, 2013
  - 21st International Symposium on Mathematical Programming, Berlin, Germany, 2012
  - SIAM Conference on Financial Engineering and Mathematics, Minneapolis, MN, 2012
  - INFORMS Annual Meeting, Charlotte, NC, 2011 (earlier version under the title “Approximate linear programming relaxations for commodity storage real option management”)
  - MSOM Annual Conference, Ann Arbor, MI, 2011 (earlier version under the title “Approximate dynamic programs for natural gas storage valuation based on approximate linear programming relaxations”)
- Approximate dynamic programming for the merchant operations of commodity and energy conversion assets, Enterprise-Wide Optimization Seminar, Carnegie Mellon University, Pittsburgh, PA, 2013.
- Valuation of multiple exercise options with energy applications, INFORMS Annual Meeting, Phoenix, AZ, 2012
- An incomplete activation procedure to generate generalized intersection cuts
  - 16th Combinatorial Optimization Workshop, Aussois, France, 2012
  - Modeling and Optimization: Theory and Applications (MOPTA), Lehigh University, Bethlehem, PA, 2012

## PROFESSIONAL EXPERIENCE

---

- **Continuous Improvements Group, Research in Motion (Blackberry)** *Apr 2011 - May 2011*  
 Consultant Waterloo, Canada
  - *Analyzed the hardware ordering process and determined opportunities for improving order fulfillment*
  - *Collaborated with multiple departments in the high technology supply chain and presented recommendations to management*
- **Dow Chemicals/CMU Enterprise-Wide Optimization Center** *Aug 2010 - Aug 2011*  
 Research consultant Pittsburgh, USA
  - *Introduced managers to the concept of merchant operations and real options*

– Collaborated with senior managers and analysts on business requirements, gathering data, and discussing findings

- **Optimization Group, Canadian Tire Corporation** *Sep 2008 - Aug 2009*  
Brampton, Canada  
Operations planning analyst
  - Worked on the modeling and solution of supply chain management and logistics problems with estimated annual savings of over 2 million Canadian dollars
  - Problems included direct shipping, work load planning, automotive spare parts inventory and routing, and container yard management
  - Helped setup optimization software infrastructure
  - Collaborated with and presented findings to higher level management
- **Optimization Group, Canadian Tire Corporation** *Jan 2008 - May 2008*  
Brampton, Canada  
Optimization intern
  - Developed optimization software to solve a shipping problem for the transportation department

## TEACHING

---

- **Instructor, Liautaud Graduate School of Business** *Aug 2014 - present*  
**University of Illinois at Chicago**  
Introduction to Operations Management  
MBA: Fall 2014, Spring 2015, Fall 2015, Fall 2016  
Corporate MBA: Fall 2016  
Supply Chain Management (graduate elective) – Spring 2015, Spring 2016, Spring 2017  
Dynamic Programming (PhD elective) – Fall 2016
- **Instructor, Mathematical Sciences, Carnegie Mellon University** *Oct 2012 - Dec 2012*  
Second half of Topics in applied mathematics: Combinatorial optimization  
(undergraduate elective; E. Balas taught the first half of this course)
- **Teaching assistant, Carnegie Mellon University** *Jan 2010 - Dec 2013*  
MBA: Optimization and decision making (F. Margot),  
Real options (N. Secomandi)  
PhD: Integer programming, Advanced integer programming, Graph theory,  
Networks and matchings, Convex polytopes (E. Balas)
- **Co-instructor, University of Waterloo** *May 2008 - Aug 2008*  
Introduction to optimization  
(undergraduate elective; J.H. Bookbinder was the primary instructor)
- **Teaching assistant, University of Waterloo** *Jan 2008 - Aug 2009*  
**Undergraduate:** Engineering economics  
**Graduate:** Logistics and supply chain management,  
Economics concepts for management
- **Completed courses at the Center for Teaching Excellence,** *Jan 2008 - Aug 2009*  
**University of Waterloo**  
Preparing for university teaching (GS901), and Teaching practicum (GS903)

## SERVICE

---

- **Associate editor, Electronic Commerce Research** *2014 - present*

- **Reviewer**

Journals: *Management Science, Operations Research, SIAM Journal on Optimization, Manufacturing and Service Operations Management, Production and Operations Management, IIE Transactions, Energy Economics, Energy Systems, INFORMS Journal on Computing, Naval Research Logistics, Computer and Operations Research, European Journal of Operations Research, Operations Research Letters, Electronic Commerce Research and Applications*

Conferences: *European Symposium on Algorithms 2013*

- **Session chair/co-chair**

- POMS Annual Conference *2016-2017*
- International Symposium on Mathematical Programming *2015*
- INFORMS Annual Meeting *2013-2017*
- INFORMS Optimization Society Conference *2016*
- SIAM Conference on Financial Engineering and Mathematics *2012*

- **Founding coordinator of IDS Operations Management PhD area** *2015 - present*

- **Founding advisor of the Operations Management Group (OMG) for graduate students at the UIC College of Business** *2015 - present*

- **Board member**

- Information and Decision Sciences (IDS) department advisory committee, University of Illinois at Chicago *2015 - present*
- Center for Research in Information Management (CRIM) faculty advisory committee, University of Illinois at Chicago *2015 - present*
- IDS MBA Committee, University of Illinois at Chicago *2015 - present*
- University Committee on Discipline, Carnegie Mellon University *2012 - 2014*
- Academic Review Board, Carnegie Mellon University *2012 - 2014*

- **Organizing committee member**

- IDS research seminar series, University of Illinois at Chicago *2015 - present*
- South Western Ontario Operations Research Day *2007*
- UW-CORS seminar series *2007*
- NAFTA workshop, University of Waterloo *2007*

- **Captain of university basketball team** *2005 - 2006*

Indian Institute of Technology Madras (selected as best university sports captain)

## MISCELLANEOUS

---

- Programming languages: C, C++, Java, R
- Software: Excel, RiskSolver, Matlab, Arena, Simul8, SPSS
- Optimization solvers: CPLEX, GUROBI, BCP, CLP
- Languages: English, Tamil
- Professional affiliations: INFORMS, POMS