

## Yanjun Li

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### Education:

6/1999 - 5/2002: Ph.D. in Industrial Administration (Operations Research), Tepper School of Business, Carnegie Mellon University.

8/1997 - 5/1999: Master of Science in Industrial Administration (Operations Research), Tepper School of Business, Carnegie Mellon University.

9/1990 - 3/1993: Master of Science in Applied Mathematics (Optimization Theory and Applications), Department of Applied Mathematics, Beijing University of Aeronautics and Astronautics.

9/1986 - 7/1990: Bachelor of Science in Applied Mathematics, Department of Applied Mathematics, Beijing University of Aeronautics and Astronautics.

### Research Interests:

Mathematical programming, integer programming, combinatorial optimization, polyhedral theory, approximation algorithms, network and graph, packing and covering, vehicle routing, lot-sizing and scheduling, and contract theory and applications.

### Teaching Interests:

Business analytics, deterministic and stochastic operations research, quantitative methods of management science, spreadsheet modeling, simulation, decision analysis, production planning, and the topics as regards my research interests.

### Academic Experience:

9/2017 - present: Director of Management Doctoral Programs, Krannert School of Management, Purdue University.

7/2016 - present: Area Coordinator of Quantitative Methods Area, Krannert School of Management, Purdue University.

8/2014 - present: Professor of Management, Quantitative Methods Area, Krannert School of Management, Purdue University.

8/2008 - 7/2014 : Associate Professor of Management, Quantitative Methods Area, Krannert School of Management, Purdue University.

8/2003 - 7/2008 : Assistant Professor of Management, Quantitative Methods Area, Krannert School of Management, Purdue University.

8/2002 - 7/2003 : Visiting Assistant Professor of Management, Quantitative Methods Area, Krannert School of Management, Purdue University.

1/1997 - 6/1997: Research Assistant, Department of Management Sciences, School of Business, City University of Hong Kong.

7/1996 - 7/1997: Research Assistant, Institute of Computational Mathematics and Scientific/Engineering Computing, Chinese Academy of Sciences.

4/1993 - 6/1996: Research Assistant, Institute of Systems Science, Chinese Academy of Sciences.

**Awards/Honors:**

1. *IIE Transactions* 2018 Quality & Reliability Engineering Best Paper Honorable Mention (with A. Alexander and R. Plante)
2. Purdue University Faculty Scholar (2014-2019)
3. Krannert Faculty Fellow, Krannert School of Management, Purdue University, 2008
4. John and Mary Willis Young Faculty Award, Krannert School of Management, Purdue University, 2008
5. Honorable mention in the INFORMS Junior Faculty Interest Group (JFIG) best paper competition, INFORMS, 2005
6. Jay N. Ross Young Faculty Scholar Award, Krannert School of Management, Purdue University, 2005
7. Krannert Distinguished MBA Teacher in Spring module of 2006-2017
8. Krannert Distinguished Undergraduate Teacher in 2002-2009 and 2011-2015
9. William L. Mellon Fellowship, Tepper School of Business, Carnegie Mellon University, 1997-2000

**Teaching Experience:**

1. "Combinatorial Optimization," Ph.D. course, Krannert School of Management, 2009 and 2013.
2. "Spreadsheet Modeling and Simulation," MBA elective course, Krannert School of Management, 2005-2018.
3. "Management Science," undergraduate core course, Krannert School of Management, 2002-2009, 2011-2014.
4. "Advanced Spreadsheet Modeling and Simulation," undergraduate elective course, Krannert School of Management, 2009 and 2014-2016.
5. "Production," undergraduate business course, Tepper School of Business, Carnegie Mellon University, 2001.
6. "Optimization Models," Graduate School of Chinese Academy of Sciences, 1996.

**Publications in Refereed Journals:**

1. "On the rational polytopes with Chvátal rank 1" (with G. Cornuéjols and D. Lee), *Mathematical Programming A*, published online, 2018.
2. "When the Gomory-Chvátal closure coincides with the integer hull" (with G. Cornuéjols), *Operations Research Letters*, 46(2), 2018, 251-256.
3. "Sustaining system coordination in outsourcing the maintenance function of a process having a linear failure rate" (with A. Alexander and R. Plante), *IIE Transactions*, 49(5), 2017, 544-552.
4. "The nonnegative node weight  $j$ -restricted  $k$ -matching problems," *Mathematics of Operations Research*, 39(3), 2014, 930-948.
5. "Polyhedron of triangle-free simple 2-matchings in subcubic graphs" (with D. Hartvigsen), *Mathematical Programming A*, 138(1-2), 2013, 43-82.
6. "Maximum cardinality simple 2-matchings in subcubic graphs" (with D. Hartvigsen), *SIAM Journal on Optimization*, 21(3), 2011, 1027-1045.
7. "Multi-period maintenance scheduling of tree networks with minimum flow disruption" (with M. Tawarmalani), *Naval Research Logistics*, 58(5), 2011, 507-530.

8. “On the extreme inequalities of infinite group problems” (with S. Dey, L. Miller and J.-P. Richard), *Mathematical Programming A*, 121(1), 2010, 145-170.
9. “Dynamic pricing and warranty policies for products with fixed lifetime” (with K. Tang and S. Zhou), *European Journal of Operational Research*, 196(3), 2009, 940-948.
10. “Valid inequalities for MIPs and group polyhedra from approximate liftings” (with L. Miller and J.-P. Richard), *Mathematical Programming A*, 118(2), 2009, 253-277.
11. “Polyhedral results for 1-restricted simple 2-matchings” (with D. Hartvigsen), *SIAM Journal on Optimization*, 19(3), 2008, 1131-1149.
12. “Cook, Kannan and Schrijver’s example revisited” (with J.-P. Richard), *Discrete Optimization*, 5(4), 2008, 724-734.
13. “New inequalities for finite and infinite group problems from approximate lifting” (with L. Miller and J.-P. Richard), *Naval Research Logistics*, 55(2), 2008, 172-191.
14. “Budget-constrained, capacitated hub location to maximize expected demand coverage in fixed-wireless telecommunication networks” (with R. Bollapragada and U. Rao), *INFORMS Journal on Computing*, 18(4), 2006, 422-432.
15. “Early estimates of the size of branch-and-bound trees” (with G. Cornuéjols and M. Karamanov), *INFORMS Journal on Computing*, 18(1), 2006, 86-96.
16. “Reduce-and-split cuts: improving the performance of mixed integer Gomory cuts” (with K. Andersen and G. Cornuéjols), *Management Science*, 51(11), 2005, 1720-1732.
17. “Split closure and intersection cuts” (with K. Andersen and G. Cornuéjols), *Mathematical Programming A*, 102, 2005, 457-493.
18. “An approximation algorithm for the edge-dilation  $k$ -center problem” (with J. Könnemann, O. Parekh and A. Sinha), *Operations Research Letters*, 32(5), 2004, 491-495.
19. “ $K$ -cuts: a variation of Gomory mixed integer cuts from the LP tableau” (with G. Cornuéjols and D. Vandenbussche), *INFORMS Journal on Computing*, 15(4), 2003, 385-396.
20. “A connection between cutting plane theory and the geometry of numbers” (with G. Cornuéjols), *Mathematical Programming A*, 93, 2002, 123-127.
21. “On the rank of mixed 0,1 polyhedra” (with G. Cornuéjols), *Mathematical Programming A*, 91, 2002, 391-397.
22. “Elementary closures for integer programs” (with G. Cornuéjols), *Operations Research Letters*, 28, 2001, 1-8.
23. “Inverse problems of submodular functions on digraphs” (with M. Cai and X. Yang), *Journal of Optimization Theory and Applications*, 104, 2000, 559-579.
24. “Inverse polymatroidal flow problem” (with M. Cai and X. Yang), *Journal of Combinatorial Optimization*, 3, 1999, 115-126.
25. “[ $k, k + 1$ ]-factor containing given Hamiltonian cycle” (with M. Cai and M. Kano), *The Electronic Journal of Combinatorics*, 6, 1999.
26. “A degree condition for a graph to have  $[a, b]$ -factors” (with M. Cai), *Journal of Graph Theory*, 27, 1998, 1-6.
27. “Tree decompositions for a certain class of graphs” (with M. Shi and F. Tian), *Discrete Mathematics*, 189, 1998, 221-232.
28. “Inverse matroid intersection problem” (with M. Cai), *Mathematical Methods of Operations Research*, 45, 1997, 235-243.
29. “A degree condition for the existence of connected factors” (with M. Cai), *Australasian Journal of Combinatorics*, 14, 1996, 77-83.

### **Publications in Refereed Conference Proceedings:**

1. “Deciding emptiness of the Gomory-Chvátal closure is NP-complete, even for a rational polyhedron containing no integer point” (with G. Cornuéjols), Proceedings of the Eighteenth Conference on Integer Programming and Combinatorial Optimization, Eds.: Q. Louveaux and M. Skutella, Springer, *Lecture Notes in Computer Science* 9682, 2016, 387-397.
2. “Triangle-free simple 2-matchings in subcubic graphs (extended abstract)” (with D. Hartvigsen), Proceedings of the Twelfth Conference on Integer Programming and Combinatorial Optimization, Eds.: M. Fischetti and D.P. Williamson, Springer, *Lecture Notes in Computer Science* 4513, 2007, 43-52.
3. “Approximation algorithms for edge-dilation  $k$ -center problems” (with J. Konemann, O. Parekh and A. Sinha), Proceedings of the Eighth Scandinavian Workshop on Algorithm Theory, Eds.: M. Penttonen and E.M. Schmidt, Springer, *Lecture Notes in Computer Science* 2368, 2002, 210-219.
4. “Split closure and intersection cuts” (with K. Andersen and G. Cornuéjols), Proceedings of the Ninth Conference on Integer Programming and Combinatorial Optimization, Eds.: W. Cook and A. Schulz, Springer, *Lecture Notes in Computer Science* 2337, 2002, 127-144.
5. “On the rank of mixed 0,1 polyhedra” (with G. Cornuéjols), Proceedings of the Eighth Conference on Integer Programming and Combinatorial Optimization, Eds.: K. Aardal and B. Gerards, Springer, *Lecture Notes in Computer Science* 2081, 2001, 71-77.

### **Working Papers:**

1. “An Edmonds-Gallai-type decomposition for the  $j$ -restricted  $k$ -matching problem” (with J. Szabó), submitted.
2. “Robust maintenance contracting under asymmetric repair cost information” (with A. Alexander and R. Plante)
3. “Sub-approximation approach to linear fractional integer programs: analytical and computational study” (with C. Park and R. Plante)
4. “Valid inequalities for the 1-restricted simple 2-matching polytope” (with D. Hartvigsen)

### **Presentations at Professional Conferences/Meetings:**

1. “On the computational complexity of optimizing over the Chvátal closure of a polytope” (with G. Cornuéjols and D. Lee), INFORMS Annual Meeting, Nashville, Tennessee, 2016.
2. “Deciding emptiness of the Gomory-Chvátal closure is NP-complete, even for a rational polyhedron containing no integer point” (with G. Cornuéjols), invited talk at the Eighteenth International Integer Programming and Combinatorial Optimization Conference, University of Liege, Belgium, 2016.
3. “Parametric approaches to fractional combinatorial problems: analytical and computational studies” (with C. Park and R. Plante), INFORMS Annual Meeting, Philadelphia, Pennsylvania, 2015.
4. “Deciding emptiness of the Gomory-Chvátal closure is NP-complete” (with G. Cornuéjols), the 22nd International Symposium on Mathematical Programming, Pittsburgh, Pennsylvania, 2015.
5. “Analytical and computational study of Ibaraki’s modified binary search algorithm” (with C. Park and R. Plante), INFORMS Annual Meeting, San Francisco, California, 2014.
6. “Valid inequalities for the 1-restricted simple 2-matching polytope” (with D. Hartvigsen),

- the Eighteenth Combinatorial Optimization Workshop, Aussois, France, 2014.
7. “Manufacturers Profit in Maintenance Outsourcing with Menu Contract” (with A. Alexander and R. Plante), INFORMS Annual Meeting, Minneapolis, Minnesota, 2013.
  8. “Valid inequalities for the 1-restricted simple 2-matching polytope” (with D. Hartvigsen), INFORMS Annual Meeting, Minneapolis, Minnesota, 2013.
  9. “A class of rank 2 facets for the 1-restricted simple 2-matching polytope” (with D. Hartvigsen), MOPTA (Modeling and Optimization: Theory and Applications), Bethlehem, Pennsylvania, 2012.
  10. “A generalized  $k$ -matching problem” (with D. Hartvigsen), the 21st International Symposium on Mathematical Programming, Berlin, Germany, 2012.
  11. “Maximum cardinality simple 2-matchings in subcubic graphs” (with D. Hartvigsen), INFORMS Midwest Regional Conference, Columbus, Ohio, 2011.
  12. “Polyhedral and algorithmic results for 1-restricted simple 2-matchings” (with D. Hartvigsen), Joint Mathematics Meetings, New Orleans, Louisiana, 2011.
  13. “The maximum weight triangle-free simple 2-matching problem in subcubic graphs” (with D. Hartvigsen), INFORMS Annual Meeting, San Diego, California, 2009.
  14. “Restricted simple 2-matchings in subcubic graphs” (with D. Hartvigsen), the 20th International Symposium on Mathematical Programming, Chicago, Illinois, 2009.
  15. “Polyhedral results for 1-restricted simple 2-matchings” (with D. Hartvigsen), INFORMS Annual Meeting, Seattle, Washington, 2007.
  16. “Cook, Kannan and Schrijvers example revisited” (with J.-P. Richard), invited talk at MIP 2007: Workshop on Mixed Integer Programming, Centre de Recherches Mathematiques, Universite de Montreal, Canada, 2007.
  17. “Triangle-free simple 2-matchings in subcubic graphs” (with D. Hartvigsen), invited talk at the Twelfth International Integer Programming and Combinatorial Optimization Conference, Cornell University, New York, 2007.
  18. “Valid inequalities for MIPs and group polyhedra from approximate liftings” (with L. Miller and J.-P. Richard), invited talk at MIP 2006: Workshop on Mixed Integer Programming, Miami, Florida, 2006.
  19. “Continuous and discontinuous extreme inequalities for infinite group problem” (with S. Dey, L. Miller and J.-P. Richard), INFORMS Annual Meeting, Pittsburgh, Pennsylvania, 2006.
  20. “Valid inequalities for MIPs and group polyhedra from approximate liftings” (with L. Miller and J.-P. Richard), INFORMS Annual Meeting, Pittsburgh, Pennsylvania, 2006.
  21. “Cook, Kannan and Schrijvers example revisited” (with J.-P. Richard), INFORMS Annual Meeting, Pittsburgh, Pennsylvania, 2006.
  22. “The polytope for 1-restricted simple 2-matchings in trees” (with D. Hartvigsen), the Nineteenth International Symposium of Mathematical Programming, Rio de Janeiro, Brazil, 2006.
  23. “Minimizing flow disruption due to network maintenance” (with M. Tawarmalani), invited talk at JFIG (Junior Faculty Interest Group) Best Paper Competition at INFORMS Annual Meeting, San Francisco, California, 2005.
  24. “Deriving strong inequalities for group polyhedra through approximate lifting” (with L. Miller and J.-P. Richard), INFORMS Annual Meeting, San Francisco, California, 2005.
  25. “Extending superadditive valid inequalities to mixed-integer programs by lifting continuous variables” (with L. Miller and J.-P. Richard), INFORMS Annual Meeting, San Fran-

cisco, California, 2005.

26. “Strengthening group polyhedra-derived cuts for mixed integer programs through liftings” (with L. Miller and J.-P. Richard), INFORMS Annual Meeting, Denver, Colorado, 2004.

27. “Early estimates of the size of branch-and-bound trees” (with G. Cornuéjols and M. Karamanov), INFORMS Annual Meeting, Denver, Colorado, 2004.

28. “Improving the performance of Gomory mixed integer cuts” (with K. Andersen and G. Cornuéjols), INFORMS Annual Meeting, San Jose, California, 2003.

29. “Approximation algorithms for edge-dilation  $k$ -center” (with J. Konemann, O. Parekh and A. Sinha), invited talk at the Eighth Scandinavian Workshop on Algorithm Theory, Turku, Finland, 2002.

30. “Split closure and intersection cuts” (with K. Andersen and G. Cornuéjols), invited talk at the Ninth Conference on Integer Programming and Combinatorial Optimization, MIT, Cambridge, Massachusetts, 2002.

31. “Budget-constrained, capacitated hub location to maximize expected demand coverage in fixed-wireless (broadband-access) telecommunication networks” (with R. Bollapragada and U. Rao), INFORMS Annual Meeting, Miami, Florida, 2001.

32. “Improving cuts in integer programming” (with K. Andersen and G. Cornuéjols), INFORMS Annual Meeting, Miami, Florida, 2001.

33. “On the rank of mixed 0,1 polyhedra” (with G. Cornuéjols), invited talk at the Eighth Conference on Integer Programming and Combinatorial Optimization, Utrecht, Netherlands, 2001.

34. “ $K$ -cuts: a variation of Gomory mixed integer cuts from the LP tableau” (with G. Cornuéjols and D. Vandenbussche), the Seventeenth Symposium on Mathematical Programming, Atlanta, Georgia, 2000.

### **Sponsored Projects:**

“Improving the current routing of OFS (Office Furniture Styline, Indiana) delivery system to optimize performance,” Co-Principal Investigator (with A. Iyer and M. Tawarmalani), sponsored by CAM (Center for Advanced Manufacturing) at Purdue University and GSCMI (Global Supply Chain Management Initiative) at Krannert School of Management, 2006.

### **Member on Doctoral Dissertation Committees:**

1. Didun Peng: Quantitative Methods Area, Krannert School of Management, Purdue University, 2018. (Dissertation title: Quality Improvement Along Supply Chain)

2. Chong Hyun Park: Quantitative Methods Area, Krannert School of Management, Purdue University, 2016. (Co-supervised with Prof. Robert Plante) (Dissertation title: Parametric Approaches to Fractional Programs: Analytical and Computational Study)

3. Jinhak Kim: Quantitative Methods Area, Krannert School of Management, Purdue University, 2016. (Dissertation title: On Cutting Planes for Cardinality Constrained Optimization Problems)

4. Arthur A. Alexander: Quantitative Methods Area, Krannert School of Management, Purdue University, 2014. (Co-supervised with Prof. Robert Plante) (Dissertation title: Maintenance Outsourcing: Sustaining System Coordination Under Symmetric and Asymmetric Information)

5. Kan Fang: Operations Research Area, School of Industrial Engineering, Purdue Uni-

versity, 2013. (Dissertation title: Algorithmic and Mathematical Programming Approaches to Scheduling Problems with Energy-Based Objects)

6. Weijia Wang: Quantitative Methods Area, Krannert School of Management, Purdue University, 2012. (Dissertation title: Organizational Learning and Knowledge Depreciation in Supplier Quality Improvement)

7. Cheng-Hung Hu: Quantitative Methods Area, Krannert School of Management, Purdue University, 2012. (Dissertation title: Step-stress Accelerated Life Tests - Design and Inference)

8. Anantha Sundararajan: Operations Research Area, School of Industrial Engineering, Purdue University, 2011. (Dissertation title: Topics in Optimization)

9. Kannan Visvanath: Operations Management Area, Krannert School of Management, Purdue University, 2007. (Dissertation title: Stochastic Location-Assignment on the Unit Interval)

10. Bo Zeng: Operations Research Area, School of Industrial Engineering, Purdue University, 2007. (Dissertation title: Efficient Lifting Methods for Unstructured Mixed Integer Programs with Multiple Constraints)

11. Santanu Dey: Operations Research Area, School of Industrial Engineering, Purdue University, 2007. (Dissertation title: Strong Cutting Planes for Unstructured Mixed Integer Programs Using Multiple Constraints)

12. Sherry Z.F. Zhou: Quantitative Methods Area, Krannert School of Management, Purdue University, 2006. (Dissertation title: Dynamic Pricing and Warranty Policies for Products with Fixed Lifetime)

13. Hakan Tarakci: Quantitative Methods Area, Krannert School of Management, Purdue University, 2004. (Dissertation title: Coordination in Maintenance Outsourcing)

14. Fu-Shiang Tseng: Quantitative Methods Area, Krannert School of Management, Purdue University, 2004. (Dissertation title: Designs of Maintenance Outsourcing Contracts)

#### **Professional Memberships:**

1. Institute for Operations Research and the Management Sciences (INFORMS)
2. Mathematical Optimization Society (MOS)
3. Society for Industrial and Applied Mathematics (SIAM)

#### **Member on Conference Program Committees:**

1. MOPTA (Modeling and Optimization: Theory and Applications), August, 2012.
2. INFORMS Midwest Regional Conference, August, 2011.

#### **Professional Activities:**

Ad hoc reviewer for *Mathematical Programming*, *Mathematics of Operations Research*, *Management Science*, *INFORMS Journal on Computing*, *Discrete Optimization*, *Operations Research Letters*, *Discrete Applied Mathematics*, *Discrete Mathematics*, *SIAM Journal on Discrete Mathematics*, *Networks*, *Manufacturing and Service Operations Management*, and *Production and Operations Management*.