Mohit Tawarmalani

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Education

Ph.D. Industrial Engineering, University of Illinois at Urbana-Champaign, August 2001
Thesis: Mixed Integer Nonlinear Programs: Theory, Algorithms and Applications

M.S. Industrial Engineering, University of Illinois at Urbana-Champaign, May 1997
Thesis: Multistage Network Optimization and Decomposition Algorithms

B.Tech. Mechanical Engineering, Indian Institute of Technology, May 1993
Thesis: Feature Extraction in Turned Components

Academic/Professional Appointments

Allison and Nancy Schleicher Chair of Management, Purdue University, July 2014 - present

Professor, Purdue University, August 2012 - present

Associate Professor, Purdue University, August 2006 - August 2012

Assistant Professor, Purdue University, August 2001 - August 2006

Software Engineer, ComputerVision, India, January 1995 - July 1995

Graduate Engineer, TELCO (Tata Engineering and Locomotive Company), India, July 1993 - December 1994

Research Interests

Mathematical Programming, Complexity and Approximation, Symbolic Computing. Research emphasis is on global optimization theory, algorithms and software. Applications and models in business, economics, systems, engineering design, and molecular design are of particular interest.

Teaching Interests

Deterministic and Stochastic Operations Research, Mathematical Programming, Global Optimization, Convex Optimization, Applied Probability and Statistics, Quantitative Analysis, Spreadsheet Modeling and Decision Analysis, Optimization Models.

Book

Tawarmalani, M. and N. V. Sahinidis, Convexification and Global Optimization in Continuous and Mixed-Integer Nonlinear Programming: Theory, Algorithms, Software and Applications, 504 pages, Kluwer Academic Publishers, 2002.

Journal Publications

1. Kim, J., M. Tawarmalani, and J.-P. P. Richard, Convexification of permutation-invariant sets and an application to Sparse PCA, *Mathematics of Operations Research*, accepted, 2021.
2. He. T. and M. Tawarmalani, Tractable Relaxations of Composite Functions, *Mathematics of Operations Research*, accepted, 2021.
3. T. J. Mathew, R. Tumbalam Gooty, M. Tawarmalani, R. Agrawal, A Simple Criterion for Feasibility of Heat Integration between Distillation Streams Based on Relative Volatilities *Industrial & Engineering Chemistry Research*, 60-28, 10286-10302, 2021.
4. J. A. Chavez Velasco, R. Tumbalam Gooty, M. Tawarmalani, R. Agrawal, Optimal design of membrane cascades for gaseous and liquid mixtures via MINLP, *Journal of Membrane Science*, 636, 119514, 2021.
5. Velasco J.-A. C., M. Tawarmalani, R. Agrawal, Systematic analysis reveals thermal separations are not necessarily most energy intensive (Perspective), *Joule*, 5, 330-343, 2021.
6. Nguyen, T. T., J.-P. P. Richard, and M. Tawarmalani, Convexification techniques for linear complementarity constraints, *Journal of Global Optimization*, 80, 249-286, 2021.
7. He, T. and M. Tawarmalani, A new framework to relax composite functions in nonlinear programs, *Mathematical Programming*, 190, 427-466, 2021.
8. Mathew, T. J., R. T. Gooty, M. Tawarmalani, and R. Agrawal, 110th Anniversary: Thermal Coupling via Heat Transfer: A Potential Route to Simple Distillation Configurations with Lower Heat Duty, *Industrial & Engineering Chemistry Research*, 58(47), 21671–21678, 2019.
9. Gooty, R. T., R. Agrawal, and M. Tawarmalani, An MINLP formulation for the optimization of multicomponent distillation configurations, *Computers & Chemical Engineering*, 125, 13–30, 2019.
10. Jiang, Z., Z. Chen, J. Huff, A. A. Shenvi, M. Tawarmalani, and R. Agrawal, Global minimization of total exergy loss of multicomponent distillation configurations, *AIChE Journal*, 65(11), e16737, 2019.
11. Jiang, Z., T. J. Mathew, H. Zhang, J. Huff, U. Nallasivam, M. Tawarmalani, and R. Agrawal, Global optimization of multicomponent distillation configurations: Global minimization of total cost for multicomponent mixture separations, *Computers & Chemical Engineering*, 126, 249–262, 2019.
12. Kim, J., M. Tawarmalani, & J.-P. P. Richard, On cutting planes for cardinality-constrained linear programs, *Mathematical Programming*, 178(1-2), 417–448, 2019.
13. Wu, J., M. Tawarmalani, and K. Kannan, Cardinality bundling with Spence-Mirrlees Reservation Prices, *Management Science*, 65-4, 1891-1908, 2019.
14. G. M. Ramapriya, A. Selvaraja, L. E. Jimenez Cucaita, J. Huff, M. Tawarmalani, R. Agrawal, Short-cut Methods versus Rigorous Methods for Performance-evaluation of Distillation Configurations, *Industrial & Engineering Chemistry Research*, 57-22, 7726-7731, 2018.
15. Z. Jiang, G. M. Ramapriya, M. Tawarmalani, R. Agrawal, Minimum Energy of Multicomponent Distillation Systems Using Minimum Additional Heat and Mass Integration Sections, *AIChE Journal*, 64-9, 3410-3418, 2018.

16. G. M. Ramapriya, M. Tawarmalani, R. Agrawal, A systematic method to synthesize all dividing wall columns for n-component separation: Part II., *AIChE Journal*, 64-2, 660-672, 2018.

17. G. M. Ramapriya, M. Tawarmalani, R. Agrawal, A systematic method to synthesize all dividing wall columns for n-component separation: Part I., *AIChE Journal*, 64-2, 649-659, 2018.

18. T. T. Nguyen, J.-P. P. Richard, and M. Tawarmalani, Deriving the convex hull of a partitioning set through lifting and projection, *Mathematical Programming*, 169, 377-415, 2018.

19. Davarnia, D., J.-P. P. Richard, and M. Tawarmalani, Simultaneous convexification of bilinear functions over polytopes with applications to network interdiction, *SIAM Journal on Optimization*, 27(3), 1801-1833, 2017.

20. Kannan, K., M. S. Rahman, and M. Tawarmalani, Economics and policy implications of restricted patch distribution on software maintenance, *Management Science*, 62, 3161-3182, 2016.

21. Nallasivam, U., V. H. Shah, A. A. Shenvi, M. Tawarmalani, and R. Agrawal, Global optimization of multicomponent distillation configurations: 2. Enumeration based minimization algorithm, *AIChE Journal*, 62-6, 2071-2086, 2016

22. Ramapriya, G. M., M. Tawarmalani, R. Agrawal, Thermal coupling links to liquid-only transfer streams: An enumeration method for new FTC dividing wall columns, *AIChE Journal*, 62, 1200-1211, 2016.

23. Ramapriya, G. M., A. Shenvi, M. Tawarmalani, R. Agrawal, A new framework for combining condenser and reboiler in a configuration to consolidate distillation columns, *Industrial Engineering & Chemistry Research*, 54, 10449-10464, 2015.

24. Gençer, E., D. S. Mallapragada, F. Maréchal, M. Tawarmalani, and R. Agrawal, Round-the-clock power supply and a sustainable economy via synergistic integration of solar thermal power and hydrogen processes, *Proceedings of the National Academy of Sciences (direct submission)*, 112, 15821-15826, 2015.

25. Bao, X., A. Khajavirad, N. V. Sahinidis, and M. Tawarmalani, Global Optimization of nonconvex problems with multilinear intermediates, *Mathematical Programming Computation*, 7, 1-37, 2015.

26. Ramapriya, G. M., M. Tawarmalani, R. Agrawal, Thermal coupling links to liquid-only tranfer streams: A path for new dividing wall columns, *AIChE Journal*, 60, 2949-2961, 2014.

27. Mallapragada, D. S., M. Tawarmalani, R. Agrawal, Synthesis of augmented biofuel processes using solar energy, *AIChE Journal*, 60, 2533-2545, 2014.

28. Ramapriya, G. M., M. Tawarmalani, R. Agrawal, Modified basic distillation configurations with intermediate sections for energy savings, *AIChE Journal*, 60, 1091-1097, 2014.

29. Chung K., J.-P. P. Richard, and M. Tawarmalani, Lifted Inequalities for 0-1 Mixed-Integer Bilinear Covering Sets, *Mathematical Programming*, 145, 403-450, 2014.

30. Tawarmalani, M., J.-P. P. Richard, and C. Xiong, Explicit convex and concave envelopes through polyhedral subdivisions, *Mathematical Programming*, 138, 531-577, 2013.

31. Nallasivam, U., V. H. Shah, A. A. Shenvi, M. Tawarmalani, and R. Agrawal, Global optimization of multicomponent distillation configurations: 1. Need for a reliable global optimization algorithm, *AIChE Journal*, 59, 971-981, 2013.

32. Bao, X., N. V. Sahinidis, and M. Tawarmalani, Semidefinite Relaxations for Quadratically Constrained Quadratic Programming: A Review with Comparisons, *Mathematical Programming*, 129, 129-157, 2011.

33. Tawarmalani, M. and Y. Li, Multi-period Network Maintenance Scheduling with Minimum Flow Disruption, *Naval Research Logistics*, 58, 507-530, 2011.

34. Tawarmalani, M. and J.-P. P. Richard and K. Chung, Strong Valid Inequalities for Orthogonal Disjunctions and Bilinear Covering Sets, *Mathematical Programming*, 124, 481-512. 2010.

35. Richard, J.-P. P., and M. Tawarmalani, Lifting Inequalities: A Framework for Generating Strong Cuts for Nonlinear Programs, *Mathematical Programming*, 121, 61-104, 2010.

36. Bao, X., N. V. Sahinidis, and M. Tawarmalani, Multiterm polyhedral relaxations for nonconvex, quadratically constrained quadratic programs, *Optimization Methods & Software*, 24, 485-504, 2009.

37. Tawarmalani, M., K. Kannan, and P. De, Allocating Objects in a Network of Caches: Centralized and Decentralized Analyses, *Management Science*, 55, 132-147, 2009.

38. Sahinidis, N. V. and M. Tawarmalani, Accelerating branch-and-bound through a language specific construct for relaxation-specific constraints, *Journal of Global Optimization*, 32, 259-280, 2005.

39. Tawarmalani, M. and N. V. Sahinidis, A Polyhedral Branch-and-Cut Approach to Global Optimization, *Mathematical Programming*, 103, 229-249, 2005.

40. Ahmed, S., M. Tawarmalani and N. V. Sahinidis, A Finite Branch and Bound Algorithm for Two-Stage Stochastic Integer Programs, *Mathematical Programming*, 100, 355-377, 2004.

41. Tawarmalani, M. and N. V. Sahinidis, Global Optimization of Mixed Integer Nonlinear Programs: A Theoretical and Computational Study, *Mathematical Programming*, 99, 563-591, 2004.

42. Sahinidis, N. V., M. Tawarmalani and M. Yu, Design of Alternative Refrigerants via Global Optimization, *American Institute of Chemical Engineers (AICHE) Journal*, 49(7) 1761-1775, 2003.

43. Tawarmalani, M. and N. V. Sahinidis, Convex Extensions and Envelopes of Lower Semi-continuous Functions, *Mathematical Programming*, 93, 247-263, 2002.

44. Tawarmalani, M., S. Ahmed and N. V. Sahinidis, Product Disaggregation and Relaxations of Mixed-Integer Rational Programs, *Optimization and Engineering*, 3, 281-303, 2002.

45. Tawarmalani, M, S. Ahmed and N. V. Sahinidis, Global Optimization of 0-1 Hyperbolic Programs, *Journal of Global Optimization*, 24, 385-417, 2002.

46. Tawarmalani, M. and N. V. Sahinidis, Semidefinite Relaxations of Fractional Programs via Novel Convexification Techniques, with N. V. Sahinidis, *Journal of Global Optimization*, 20, 137-158, 2001.

47. Sahinidis, N. V. and M. Tawarmalani, Applications of Global Optimization to Process and Molecular Design, *Computers & Chemical Engineering*, 24, 2157-2169, 2000.

48. Adhya, N., M. Tawarmalani and N. V. Sahinidis, A Lagrangian Approach to the Pooling Problem, *Industrial & Engineering Chemistry Research*, 38(5), 1956-1972, 1999.

Trade Publications

1. Mathew, T. J., R. T. Gooty, M. Tawarmalani, R. Agrawal, Quickly assess distillation columns, *Chemical Engineering Progress*, 27-34, December 2020.

Refereed Book Chapters

1. Tawarmalani, M. and N. V. Sahinidis, Exact Algorithms for Mixed Integer Nonlinear Programming, Handbook of Global Optimization, Volume 2, P. M. Pardalos and H. E. Romeijn (eds.), Kluwer Academic Publishers, 2002.

2. Tawarmalani, M. and N. V. Sahinidis, The Time Dependent Traveling Salesman Problem, *Encyclopedia of Optimization*, C. A. Floudas and P. M. Pardalos (eds.) Kluwer Academic Publishers, Vol 5, 445-450, 2001.

Working Papers

1. A. Chandra and M. Tawarmalani, Probability estimation via policy restrictions, convexification, and approximate sampling, Mathematical Programming, submitted

2. R. T. Gooty, R. Agrawal, M. Tawarmalani, Advances in MINLP to identify energy efficient distillation configurations, Operations Research, submitted

3. T. J. Mathew, R. T. Gooty, M. Tawarmalani, R. Agrawal, Thermal coupling via heat transfer: Shortcut criteria for feasibility of heat integration in multicomponent distillation, working paper.

4. R. T. Gooty, T. J. Mathew, M. Tawarmalani, R. Agrawal, An MINLP formulation to identify thermodynamically-efficient distillation configurations, working paper

5. Z. Jiang, M. Tawarmalani, and R. Agrawal, An Accurate Minimum Reflux Calculation Method for Multi-Feed, Multi-Product Distillation Columns Distilling Ideal Multicomponent Mixtures: I. Mathematical Model, working paper

6. Z. Jiang, M. Tawarmalani, and R. Agrawal, An Accurate Minimum Reflux Calculation Method for Multi-Feed, Multi-Product Distillation Columns Distilling Ideal Multicomponent Mixtures: II. Optimization Model and Case Studies, working paper

7. M. Tawarmalani, and J.-P. P. Richard, Decomposition techniques in convexification of inequalities, working paper.

8. Tawarmalani, M., Inclusion certificates and simultaneous convexification of functions, working paper.

Refereed Conference Proceedings

1. J. A. Chavez Velasco, Z. Chen, R. Tumbalam Gooty, M. Tawarmalani, R. Agrawal, Energy-efficient membrane cascades for industrial separations *Computer Aided Chemical Engineering*, 50 (2021) 359-364.

2. Jiang, C., S. Rao, and M. Tawarmalani, PCF: Provably Resilient Flexible Routing, Proceedings of the Annual conference of the ACM Special Interest Group on Data Communication on the applications, technologies, architectures, and protocols for computer communication (Sigcomm 2020), 139–153, 2020.

3. Chang, Y., C. Jiang, A. Chandra, S. G. Rao, and M. Tawarmalani, Lancet: Better network resilience by designing for pruned failure sets, In Proceedings of the ACM on Measurement and Analysis of Computing Systems ACM New York (Sigmetrics 2020), NY, USA, 3, Article 49, 1-26, 2019.

4. Jiang Z., G. M Ramapriya, M. Tawarmalani, R. Agrawal, Process Intensification in Multicomponent Distillation, Chemical Engineering Transactions, 69, 2018.

5. Gooty R. T., P. Mobed, M. Tawarmalani, R. Agrawal, Optimal Multicomponent Distillation Column Sequencing: Software and Case Studies, Computer Aided Chemical Engineering, 44, 223-228, 2018.

6. Barik, A., J. Honorio and M. Tawarmalani, Information Theoretic Limits For Linear Prediction with Graph-Structured Sparsity, IEEE Symposium on Information Theory, IEEE International Symposium on Information Theory, 2348-2352, 2017.

7. Chang, Y., S. Rao, and M. Tawarmalani, Robust validation of network designs under uncertain demands and failures,, *NSDI 2017*, 347–362.

8. Gençer, E., M. Tawarmalani, and R. Agrawal, Integrated solar thermal hydrogen and power coproduction process for continuous power supply and production of chemicals, *Computer Aided Chemical Engineering 12 International Symposium on Process Systems Engineering and 25 European Symposium on Computer Aided Process Engineering*, 37, 2291-2296, 2015.

9. Narayanan, S., A. Sivakumar, S. Rao, and M. Tawarmalani, Performance sensitive replication in geo-distributed cloud datastores, *IEEE/IFIP International Conference on Dependable Systems and Networks*, 240-251, DSN 2014.

10. Gençer, E., D. Mallapragada, M. Tawarmalani, and R. Agrawal, Synergistic biomass and natural gas conversion to liquid fuel with reduced CO2 Emissions, *FOCAPD*, 2014.

11. Nguyen, T. T., M. Tawarmalani, and J.-P. P. Richard, Convexification Techniques for Linear Complementarity Constraints, 15th conference on Integer Programming and Combinatorial Optimization, NY, 2011.

12. Hajjat, M., X. Sun, Y.W. Sung, D. Maltz, S. G. Rao, K. Sripanidkulchai, and M. Tawarmalani, Cloudward bound: Planning for Beneficial Migration of Enterprise Applications to the Cloud, *Proceedings of ACM Sigcomm*, 2010.

13. Xia, Q., O. Ersoy, M. Tawarmalani, and H. Moskowitz, Interactive Clustering and Classification, Proceedings of Artificial Neural Networks in Engineering, ANNIE 2008, 463-470, St. Louis, 2008.

14. Tawarmalani, M., K. Kannan and P. De, A Mechanism for Allocating Objects in a Network of Symmetric Caches, Proceedings of the Fifteenth Workshop on Information Technologies and Systems, Las Vegas, 249-254, 2005.

Presentations

1. J. Kim, M. Tawarmalani, and J.-P. P. Richard, On SDP relaxations for sparse principal component analysis, INFORMS 2021.
2. C. Jiang, S. Rao, and M. Tawarmalani, Resilient and flexible routing, INFORMS 2021.
3. J. Kim, J.-P. P. Richard, and M. Tawarmalani, A reciprocity between tree ensemble optimization and multilinear optimization over the Cartesian product of simplices, INFORMS 2021.
4. A. Chandra and M. Tawarmalani, Optimization for probability estimation and application to network reliability, INFORMS 2021.
5. H.-J. Oh and M. Tawarmalani, Convexification of disjoint bilinear programs, INFORMS 2021.
6. M. Tawarmalani and A. Chandra, Quantifying probabilities using optimization techniques, SIAM conference on optimization, 2021.
7. J. Kim, M. Tawarmalani, and J.-P. P. Richard, Decision forests and multilinear polytopes, SIAM conference on optimization, 2021.
8. Kim, J., B. Taslimi, J.-P. P. Richard, and M. Tawarmalani, A cutting plane for tree-ensembles optimization, INFORMS 2020.
9. Richard, J.-P. P., and M. Tawarmalani, J. Kim, Permutation invariance in 0-1 mixed integer programming, INFORMS 2020.
10. Chandra, A., and M. Tawarmalani, Optimization techniques for probability estimation, INFORMS, 2020.
11. Gooty, R. T., R. Agrawal and M. Tawarmalani, Energy-Efficient Disitillation Configurations: Novel Formulation, Relaxations, and Discretizations, CAST Director's Student Presentation Award Finalists, AICHE Annual Meeting, 2020.
12. Chen, Z., R. T. Gooty, J. A. C. Velasco, M. Tawarmalani, and R. Agrawal, Global optimization of multicomponent membrane cascade, AICHE Annual Meeting, 2020.
13. Velasco, J. A. C., M. Tawarmalani, and R. Agrawal, A Novel Methodology to Correctly Compare the Energy Efficiency between Membranes and Distillation, AIChE Annual Meeting, Orlando, FL, United States, 2019.
14. Mathew, T., A. Jalan, C. Goheen, G. Kocis, S. Narayanan, L. Yang, M. Tawarmalani, and R. Agrawal, Process Conceptualization in a Carbon-Constrained World: Leveraging Optimization and Systems Engineering to Balance Multiple Objectives, AIChE Annual Meeting, Orlando, FL, United States, 2019.
15. Taslimi, B., J. Kim, J.-P. P. Richard, and M. Tawarmalani, Computational Evaluation of New Mixed-Integer Programming Models for Tree Ensembles Optimization, INFORMS Annual Meeting, 2019.

16. Kim, J., B. Taslimi, J.-P. P. Richard, and M. Tawarmalani, Polyhedral Results for Tree Ensembles Optimization, INFORMS Annual Meeting, 2019.

17. Tawarmalani, M., and T. He, New Relaxations for Composite Functions, CRM/DIMACS Workshop on Mixed-Integer Nonlinear Programming, Montreal, 2019.

18. Tawarmalani, M., and T. He, New Relaxations for Composite Functions, INFORMS Annual Meeting 2019, Seattle, WA, United States, 2019.

19. Tawarmalani, M., and T. He, New Relaxations for Composite Functions, Mixed Integer Nonlinear Programming: A Hatchery of Modern Mathematics, Mathematical Research Institute of Oberwolfach, Oberwolfach, Germany, 2019.

20. Tawarmalani, M., and T. He, New Relaxations for Composite Functions, Los Alamos National Laboratory, Los Alamos, NM, United States, 2019.

21. R. T. Gooty, R. Agrawal, and M. Tawarmalani, On Piecewise Under- and Over-Estimators of Fractional Terms, AIChE Annual Meeting, Salt Lake City, 2018

22. Z. Jiang, M. Tawarmalani, and R. Agrawal, Minimum Reflux Behavior of Multicomponent Mixture Separation Using Complex Distillation Columns, AIChE Annual Meeting, Salt Lake City, 2018

23. T. J. Mathew, R. T. Gooty, M. Tawarmalani, and R. Agrawal, Optimization of Heat-Integrated Multicomponent Distillation Sequences, AIChE Annual Meeting, Salt Lake City, 2018

24. R. T. Gooty, T. J. Mathew, M. Tawarmalani, and R. Agrawal, An MINLP Formulation for the Optimization of Heat-Pump Assisted Distillation Configurations, AIChE Annual Meeting, Salt Lake City, 2018

25. J.-P. P. Richard, J. Kim, B. Taslimi, and M. Tawarmalani, Computational Evaluation of New Models for Tree Ensembles Optimization, INFORMS Annual Meeting, Phoenix, 2018

26. T. He and M. Tawarmalani, Mining Expression Trees to Improve Factorable Relaxations, INFORMS Annual Meeting, Phoenix, 2018

27. T. He and M. Tawarmalani, New Convexification Techniques for Nonconvex Optimization, INFORMS Optimization Society Conference, 2018

28. J.-P. Richard, B. Taslimi, J. Kim, and M. Tawarmalani, Computational Evaluation of new MIP Models for Tree Ensembles Optimization, ISMP, Bordeaux, 2018

29. M. Tawarmalani and T. He, Product Convexification: A new relaxation framework for nonconvex programs, ISMP, Bordeaux, 2018

30. M. Tawarmalani and T. He, Product Convexification: A new relaxation framework for nonconvex programs, Designing and Implementation Algorithms for Mixed-Integer Nonlinear Optimization, Dagstuhl Seminar 18081, 2018

31. Gooty, R. T., P. Mobed, M. Tawarmalani and R. Agrawal, A Tightly Constrained MINLP-Based Formulation for the Identification of Energy Efficient Distillation Configurations, AIChE Annual Meeting, Minneapolis, 2017

32. Jiang, Z., M. Tawarmalani and R. Agrawal, Process Intensification in Multicomponent Distillation, AIChE Annual Meeting, Minneapolis, 2017

33. Mobed P., Z. Jiang, T. J. Mathew, M. Tawarmalani and R. Agrawal, Global Minimization of Multicomponent Distillation Configurations' Total Cost, AIChE Annual Meeting, Minneapolis, 2017

34. Jiang Z., M. Tawarmalani and R. Agrawal, A New Minimum Reflux Calculation Method for Multiple-Feed Distillation Columns Distilling Ideal Multicomponent Mixtures, AIChE Annual Meeting, Minneapolis, 2017

35. Ridha T., E. Gençer, Y. Li, M. Tawarmalani, W. N. Delgass, F. Ribeiro and R. Agrawal, Upgrading Fast-Hydropyrolysis Products of Cellulose to Higher Molecular Weight Products Using Systems-Level Molecular Mapping

36. Tawarmalani, M. and T. He, Product Convexification: A new relaxation framework for nonconvex programs, MIT OR Center, 2017

37. Taotao, H. and M. Tawarmalani, On Relaxations of Products of Functions, INFORMS Annual Meeting, Houston, 2017

38. Tawarmalani, M. and H. Taotao, Revisiting the factorable relaxation scheme, SIAM Conference on Optimization, Vancouver, 2017

39. Jiang, Z., G. M. Ramapriya, R. T. Gooty, M. Tawarmalani, and R. Agrawal, A Method for Minimization of Total Exergy Loss over the Complete Search Space of Regular Distillation Configurations, AIChE Annual Meeting, San Francisco, 2016

40. Jiang, Z., G. M. Ramapriya, R. T. Gooty, M. Tawarmalani, and R. Agrawal, Process Intensification of Multicomponent Distillation Configurations Using Minimum Additional Number of Heat and Mass Integrated Sections, AIChE Annual Meeting, San Francisco, 2016

41. Gençer E., M. Tawarmalani, and R. Agrawal, Systematic Process Design Strategies For Efficient and Synergistic Integration of Solar Thermal Hydrogen, Electricity, and Fresh Water Production Processes, AIChE Annual Meeting, San Francisco, 2016

42. Tao, J., T. Nguyen, and M. Tawarmalani, An iterative rounding algorithm and almost feasibility for nonconvex optimization, INFORMS Annual Meeting, Nashville, 2016

43. He, T. and M. Tawarmalani, On LP Relaxations for Nonlinear Programs, INFORMS Annual Meeting, Nashville, 2016

44. Wu, J., M. Tawarmalani, and K. Kannan, Cardinality Bundling with Complex Costs, INFORMS Annual Meeting, Nashville, 2016

45. Tawarmalani, M., J. Kim, and J.-P. P. Richard, Exploiting Permutation-Invariance to Construct Tight Relaxations, INFORMS Annual Meeting, Nashville, 2016

46. Rao, S. G., Y. Chang and M. Tawarmalani, Robust Network Design with Flexible Routing, NSF Algorithms in the Field Workshop on Algorithms for Software-Defined Networking, New Jersey, 2016

47. Tawarmalani, M., J. Kim, and J.-P. P. Richard, Exploiting Permutation-Invariance to Construct Tight Relaxations, MIP 2016, Miami, 2016

48. Ramapriya, G. M., M. Tawarmalani, R. Agrawal, A Heat & Mass Integration Approach to Reduce Capital and Operating Costs of a Distillation Configuration, AIChE Annual Meeting, Salt Lake City, 2015

49. Ramapriya, G. M., M. Tawarmalani, R. Agrawal, Efficient Separation-Process Synthesis, AIChE Annual Meeting, Salt Lake City, 2015

50. Gençer, E., M. Tawarmalani, R. Agrawal, Integrated Process Design for Efficient Solar Thermal Hydrogen and Power Production, AIChE Annual Meeting, Salt Lake City, 2015

51. Kim, J., J.-P. P. Richard, M. Tawarmalani, Sparse Principal Component Analysis (SPCA) via Convexification, INFORMS Annual Meeting, Philadelphia, 2015

52. Davarnia, D., J.-P. P. Richard, M. Tawarmalani, Envelopes of Bilinear Functions over Polytopes With Application to Network Interdiction, INFORMS Annual Meeting, Philadelphia, 2015

53. Kim, J., J.-P. P. Richard, M. Tawarmalani, A Cut Generation Procedure for Cardinality Constrained Optimization Problems (CCOP), ISMP, Pittsburgh, 2015

54. Davarnia, D., J.-P. P. Richard, M. Tawarmalani, Envelopes of Bilinear Functions over Polytopes with Applications to Network Interdiction, ISMP, Pittsburgh, 2015

55. Richard, J.-P. P., D. Davarnia, M. Tawarmalani, Improved Formulations for Network Interdiction through Envelopes of Bilinear Functions over Polytopes, MIP, Chicago, 2015

56. Gençer, E., M. Tawarmalani, R. Agrawal, Efficient Solar Thermal Integrated Power and Chemical Production Cycles for Uninterrupted Power Supply, 7th Annual AIChE Midwest Regional Conference, Chicago, 2015

57. Gençer, E., D. Mallagragada, M. Tawarmalani, and R. Agrawal, Synergistic biomass and natural gas process design for liquid fuel production with reduced CO_2 emissions, AIChE Annual Meeting, Atlanta, 2014

58. Ramapriya, G. M., M. Tawarmalani and R. Agrawal, Plethora of dividing wall columns for fully thermally coupled distillation, AIChE Annual Meeting, Atlanta, 2014

59. Gençer, E., D. Mallagragada, F. Maréchal, M. Tawarmalani, and R. Agrawal, High efficiency solar thermal power and integrated chemical storage cycles for continuous grid power supply, AIChE Annual Meeting, Atlanta, 2014

60. Tawarmalani, M., and J.-P. P. Richard, Techniques in convexification of separable polynomial inequalities, INFORMS Annual Meeting, San Francisco, 2014

61. Richard, J.-P. P., T. Nguyen, and M. Tawarmalani, On the equate-and-relax procedure for LPCCs, INFORMS Annual Meeting, San Francisco, 2014

62. Kim, J., J.-P. P. Richard, and M. Tawarmalani, On cutting planes for cardinality constrained optimization problems, INFORMS Annual Meeting, San Francisco, 2014

63. Davarnia, D., J.-P. P. Richard, and M. Tawarmalani, On convex relaxations of network interdiction problems, INFORMS Annual Meeting, San Francisco, 2014

64. Wu, J., K. Kannan, and M. Tawarmalani, Cardinality bundling with constrained prices, INFORMS Annual Meeting, San Francisco, 2014

65. K. Kannan, M. Tawarmalani, and J. Wu, Cardinality bundles with constrained prices, 8th China Workshop on Information Management, Chengdu, China, 2014

66. Tawarmalani, M., J.-P. P. Richard, Decomposition techniques in convexification of separable polynomial inequalities, Georgia Tech ISyE Colloquium, Atlanta, 2014

67. Richard, J.-P. P, T. Nguyen, and M. Tawarmalani, On the Convex Hull of some Nonlinear Sets, 18th Combinatorial Optimization Workshop, Aussois, 2014

68. Wu, J., K. Kannan, and M. Tawarmalani Cardinality Bundles for Spence-Mirrlees Reservation Prices, INFORMS Annual Meeting, Minnesota, 2013

69. Kim, J., M. Tawarmalani, and J.-P. P. Richard, Cardinality Constrained Linear Program: Facial Disjunctive Formulation and Valid Inequalitis, INFORMS Annual Meeting, Minnesota, 2013

70. Tawarmalani, M., T. Nguyen, and J.-P. P. Richard, Convexification Techniques for Complementarity Constraints, INFORMS Annual Meeting, Minnesota, 2013

71. Tawarmalani, M. and J.-P. P. Richard, Convexification Techniques for Separable Polynomial Inequalities, INFORMS Annual Meeting, Minnesota, 2013

72. Richard, J.-P. P. and M. Tawarmalani, On the Convex Hull of some Nonlinear Sets, INFORMS Annual Meeting, Minnesota, 2013

73. Davarnia, D., J.-P. P. Richard and M. Tawarmalani, Polyhedral Results for Network Interdiction Problem, INFORMS Annual Meeting, Minnesota, 2013

74. Nguyen, T. T., J.-P. Richard, and M. Tawarmalani, Disjunctive Cutting Planes for Linear Complementarity Constraints, INFORMS Annual Meeting, Phoenix, 2012

75. Khajavirad, A. X. Bao, N. V. Sahinidis, M. Tawarmalani, Global Optimization of Nonconvex Problems with Multilinear Intermediates, INFORMS Annual Meeting, Phoenix 2012

76. M. Tawarmalani and J.-P. P. Richard, Strong Cuts for Polynomial Inequalities via Disjunctive Arguments, INFORMS Annual Meeting, Phoenix, 2012

77. Nguyen, T. T., M. Tawarmalani, and J.-P. P. Richard, Convexification Techniques for Linear Complementarity Constraints, INFORMS Annual Meeting, Charlotte, 2011

78. Nguyen, T. T., J.-P. P. Richard, and M. Tawarmalani, Cutting Planes for Linear Complementarity Constraints, INFORMS Annual Meeting, Charlotte, 2011

79. Richard, J.-P. P., K. Chung, and M. Tawarmalani, On Relations between 0-1 mixed integer Bilinear Covering Sets and Fixed-charge Flow Sets, INFORMS Annual Meeting, Charlotte, 2011

80. Tawarmalani, M. and J.-P. P. Richard, Strong Inequalities for Polynomial Covering Sets via Orthogonal Disjunctions, INFORMS Annual Meeting, Charlotte, 2011

81. Nguyen, T. T., M. Tawarmalani, and J.-P. P. Richard, Convexification Techniques for Linear Complementarity Constraints, 15th conference on Integer Programming and Combinatorial Optimization, 2011.

82. Tawarmalani, M., T. T. Nguyen, and J.-P. P. Richard, On Convex Relaxations for Orthogonal Disjunctions and Complementarity Constraints, Exploratory Workshop of Mixed-Integer Nonlinear Programming, Seville, Spain, 2010.

83. Nallasivam, U., V. H. Shah, A. A. Shenvi, R. Agrawal, and M. Tawarmalani, Global Optimization of Multicomponent Distillation Configurations, Salt Lake City, 2010.

84. Tawarmalani, M., J.-P. P. Richard, and C. Xiong, Explicit Envelopes through Polyhedral Subdivisions, INFORMS Annual Meeting, Austin, 2010.

85. Tawarmalani, M., Simultaneous Convexification of Nonlinear Functions and Sets, INFORMS Annual Meeting, Austin, 2010.

86. Nguyen, T. T, J.-P. P. Richard, and M. Tawarmalani, Global Optimization Results for Linear Complementarity Problems, INFORMS Annual Meeting, Austin, 2010.

87. Hajjat, M., X. Sun, Y.W. Sung, D. Maltz, S. G. Rao, K. Sripanidkulchai, and M. Tawarmalani, Cloudward bound: Planning for Beneficial Migration of Enterprise Applications to the Cloud, ACM Sigcomm, New Delhi, India, 2010.

88. J.-P. P. Richard, M. Tawarmalani, and C. Xiong, Explicit Convex and Concave Envelopes via Polyhedral Subdivisions, MIP, Atlanta, 2010.

89. Tawarmalani, M. Polyhedrality and Inclusion Certificates in Convexification, European Workshop on Mixed-Integer Nonlinear Programming, Marseille, France, 2010.

90. Tawarmalani, M., N. V. Sahinidis, and X. Bao, Exploiting Multilinearity in Global Optimization Relaxations, INFORMS Annual Meeting, San Diego, October 2009.

91. C. Xiong, M. Tawarmalani, and J.-P. P. Richard, Convexification of Nonconvex Functions and Polyhedral Envelopes, INFORMS Annual Meeting, San Diego, October 2009.

92. Sahinidis, N. V., and M. Tawarmalani, Global Optimization of MINLPs with BARON, INFORMS Annual Meeting, San Diego, October 2009.

93. K. Chung, J.-P. P. Richard, and M. Tawarmalani, Strong Valid Inequalities for an MPCC via Orthogonal Disjunctions, INFORMS Annual Meeting, San Diego, October 2009.

94. Bao, X., N. V. Sahinidis, and M. Tawarmalani, Polyhedral Relaxations for Nonconvex Quadratically-Constrained Quadratic Programs, AIChE Annual Meeting, Philadelphia, November 2008.

95. Xia, Q., O. Ersoy, M. Tawarmalani, and H. Moskowitz, Interactive Clustering and Classification, Artificial Neural Networks in Engineering (ANNIE), St. Louis, November 2008.

96. Sahinidis, N. V. and M. Tawarmalani, Computational Solution of MINLPs with BARON, INFORMS Annual Meeting, Washington DC, October 2008.

97. Sahinidis, N. V. and M. Tawarmalani, A Unifying Framework for Domain Reduction, INFORMS Annual Meeting, Washington DC, October 2008.

98. Tawarmalani, M., and J.-P. P. Richard, Strong Inequalities for Disjunctive Sets Via Lifting, INFORMS Annual Meeting, Washington DC, October 2008.

99. Tawarmalani, M., K. Chung, and J.-P. P. Richard, Strong Inequalities for Orthogonal Disjunctions and Polynomial Covering Sets, INFORMS Annual Meeting, Washington DC, October 2008.

100. Tawarmalani, M., K. Chung, and J.-P. P. Richard, Strong Inequalities for Bilinear Knapsack Sets, INFORMS Optimization Society Conference, Atlanta, March 2008.

101. Tawarmalani, M., and J.-P. P. Richard, Lifting Inequalities: Generating Strong Cuts for Nonlinear Programs, INFORMS Optimization Society Conference, Atlanta, March 2008.

102. Chung, Kwanghun, M. Tawarmalani, and J.-P. P. Richard, Strong Valid Inequalities for Bilinear Integer Knapsack Sets, INFORMS Annual Meeting, Seattle, November 2007.

103. Tawarmalani, M., and J.-P. P. Richard, Extending mixed-integer programming lifting techniques to nonlinear programming, ICCOPT-MOPTA 2007, Hamilton, August 2007.

104. Tawarmalani, M., and J-P. P. Richard, Generating Strong Cuts for Nonlinear Programs by Lifting Inequalities, Workshop on Mixed Integer Programming, MIP 2007, Montreal, August 2007.

105. Rahman, Mohammad S., K. Kannan and M. Tawarmalani, The Countervailing Incentive of Restricted Patch Distribution: Economic and Policy Implications, Workshop on the Economics of Information Security, Pittsburgh, June 2007.

106. Tawarmalani, M., Convex Extensions, Inclusion Certificates and Disjunctive Programming, INFORMS Annual Meeting, Pittsburgh, 2006.

107. Tawarmalani, M. and J.-P. P. Richard, MIP Lifting Techniques for Nonlinear Programs, INFORMS Annual Meeting, Pittsburgh, INFORMS Annual Meeting, Pittsburgh, 2006.

108. Tawarmalani, M., K. Kannan and P. De, Allocating Objects in a Network of Caches: Centralized and Decentralized Analyses, INFORMS Annual Meeting, Pittsburgh, 2006.

109. Tawarmalani, M., Convex Extensions, Inclusion Certificates and Disjunctive Programming, 19th Mathematical Programming Symposium, Rio De Janerio, 2006.

110. J.-P. Richard and M. Tawarmalani, MIP Lifting Techniques for Mixed-Integer Nonlinear Programs, MIP 2006, Coral Gables, 2006.

111. Tawarmalani, M., Inclusion Certificates and Disjunctive Programming, Carnegie Mellon University, Pittsburgh, 2006.

112. Tawarmalani, M., K. Kannan and P. De, A Mechanism for Allocating Objects in a Network of Symmetric Caches, Fifteenth Workshop on Information Technologies and Systems, Las Vegas, 2005.

113. Tawarmalani, M., Convex Extensions and Convexification of Nonlinear Sets, INFORMS Annual Meeting, San Francisco, November 2005.

114. J.-P. Richard and M. Tawarmalani, MIP Lifting Techniques for Mixed-Integer Nonlinear Programs, INFORMS Annual Meeting, San Francisco, November 2005.

115. J. Wei, M. Duran, K. Furman, N. V. Sahinidis and M. Tawarmalani, Global Optimization of Stochastic Nonconvex Mixed Integer Nonlinear Programming (MINLP) Problems, INFORMS Annual Meeting, San Francisco, November 2005.

116. M. Tawarmalani and Y. Li, Minimizing Flow Disruption due to Network Maintenance, INFORMS Annual Meeting, San Francisco, November 2005.

117. N. V. Sahinidis and M. Tawarmalani, Global Optimization with Branch-and-Reduce, INFORMS Annual Meeting, San Francisco, November 2005.

118. Tawarmalani, M., K. Kannan. P. De and C. Kumar, Allocating Objects in a Network of Caches: Social Welfare and Incentive Compatibility, First CDGO International Conference, Blacksburg, August 2005.

119. Tawarmalani, M. and N. V. Sahinidis, Solving Nonlinear Global Optimization Problems Using BARON, INFORMS ICS 9th Conference, Annapolis, 2005.

120. Tawarmalani, M., Convexification and Global Optimization of Nonlinear programs, Workshop on Integer Programming and Continuous Optimization, Chemnitz, November 2004.

121. Sahinidis N. V. and M. Tawarmalani, Strengthening Polyhedral Relaxations for Global Optimization Problems, AIChE Annual Meeting, Austin 2004.

122. Sahinidis N. V. and M. Tawarmalani, A Polyhedral Branch-and-Cut Algorithm for Global Optimization, INFORMS, Denver, October 2004.

123. Tawarmalani, M., Convex Extensions and Convexification of Nonlinear Functions, INFORMS Annual Meeting, Atlanta, October 2003.

124. Tawarmalani, M. and N. V. Sahinidis, A Two-Step Procedure for Convexification of Lower Semicontinuous Functions, INFORMS Annual Meeting, Atlanta, October 2003.

125. Sahinidis, N. V. and M. Tawarmalani, Global Optimization with GAMS/BARON, Atlanta, October 2003.

126. Tawarmalani, M., Convex extensions and polyhedral basis, 18th International Symposium of Mathematical Programming, Denmark, August 2003.

127. Sahinidis, N. V. and M. Tawarmalani, Global Optimization with BARON, INFORMS Annual Meeting, San Jose, November 2002.

128. Tawarmalani, M. Convex Extensions and Polyhedral Basis, INFORMS, San Jose, November 2002.

129. Tawarmalani, M. and N. V. Sahinidis, Finiteness and Convexification Issues in Mixed-Integer Nonlinear Programming, Integer Programming Conference in Honor of Egon Balas, Pittsburgh, PA, June 2002.

130. Tawarmalani, M. and N. V. Sahinidis, Global Optimization of Mixed Integer Nonlinear Programs, AICHE Annual Meeting, November 2001.

131. Sahinidis N. V., M. Tawarmalani, M. Yu, and G. Nanda, A Novel MINLP Approach to Molecular Design, AICHE Annual Meeting, November 2001.

132. Tawarmalani, M. and N. V. Sahinidis, Convex Envelopes of Nonlinear Functions, INFORMS, Miami, November 2001.

133. Sahinidis N. V. and M. Tawarmalani, Global Optimization of Mixed Integer Nonlinear Programs, INFORMS, Miami, November 2001.

134. Tawarmalani, M. and N. V. Sahinidis, Domain Reduction in Global Optimization and Mixed Integer Nonlinear Programs, INFORMS, Miami, November 2001.

135. Tawarmalani, M. and N. V. Sahinidis, Global Optimization of Mixed Integer Nonlinear Programs, 17th International Symposium of Mathematical Programming, Atlanta, August 2000.

136. Tawarmalani, M. and N. V. Sahinidis, Semidefinite Relaxations of Fractional Programs Via Novel Techniques for Constructing Convex Envelopes of Nonlinear Functions, 17th International Symposium of Mathematical Programming, Atlanta, August 2000.

137. Ahmed,S.., M. Tawarmalani, and N. V. Sahinidis, Global Optimization of Two-stage Stochastic Integer Programs, 17th International Symposium of Mathematical Programming, Atlanta, August 2000.

138. Tawarmalani, M. and N. V. Sahinidis, Semidefinite Relaxations of Fractional Programs via Novel Techniques for Constructing Convex Envelopes of Nonlinear Functions, International Conference on Advances in Convex Analysis and Global Optimization Samos, Greece, June 2000.

139. Ahmed, S., M. Tawarmalani and N. V. Sahinidis, Global Optimization for Stochastic Integer Programming, International Conference on Advances in Convex Analysis and Global Optimization Samos, Greece, June 2000.

140. Tawarmalani, M. and N. V. Sahinidis, Convexification using Convex Extensions and Semidefinite Relaxations of Fractional Programs, INFORMS Annual Meeting, Salt Lake City, Utah, May 2000.

141. Ahmed, S., M. Tawarmalani, and N. V. Sahinidis, A Finite Branch and Bound Algorithm for Two-Stage Stochastic Integer Programs, INFORMS Annual Meeting, Salt Lake City, Utah, May 2000.

142. Tawarmalani, M., S. Ahmed, and N. V. Sahinidis, Convexification Tools in Integer Programming, INFORMS Annual Meeting, Philadelphia, PA, November 1999.

143. Ahmed, S., M. Tawarmalani and N. V. Sahinidis, Global Optimization of Two-Stage Stochastic Mixed-Integer Programs, INFORMS Annual Meeting, Philadelphia, PA, November 1999.

144. Sahinidis, N. V., M. Tawarmalani, and M. Yu, Novel Molecular Designs Via Global Optimization, AICHE Annual Meeting, Dallas, TX, October 1999.

145. Ahmed, S., M. Tawarmalani and N. V. Sahinidis, A Finite Branch and Bound Scheme for Two-Stage Stochastic Integer Programs, INFORMS Annual Meeting, Cincinnati, OH, May 1999.

146. Sahinidis, N. V., M. Tawarmalani, and S. Ahmed, New Results in 0-1 Optimization, AICHE Annual Meeting, Miami Beach, FL, November 1998.

147. Tawarmalani, M., S. Ahmed and N. V. Sahinidis, Convexification of 0-1 Fractional Programs, INFORMS Annual Meeting, Seattle, WA, October 1998.

148. Tawarmalani, M., N. Adhya and N. V. Sahinidis, Global Optimization of the pooling problem, INFORMS Annual Meeting, Seattle, WA, October 1998.

149. Tawarmalani, M., N. Adhya and N. V. Sahinidis, Global Optimization of the pooling problem, 2nd Engineering Design Automation Conference, Maui, HI, August 1998.

150. Tawarmalani, M. and N. V. Sahinidis, Decomposition method for the TDTSP and QAP, INFORMS Annual Meeting, Washington, DC, May 1996.

Software

- Co-authored BARON (Branch and Reduce Optimization Navigator) for global optimization of mixed-integer nonlinear programs
- Data Reduction subroutine (Merge) for CADDS5

Honors

- Distinguished Residential Master's Program Teacher, Spring 2021
- Runner-up, Salgo Noren Foundation Award for Excellence in Teaching, Krannert School of Management, 2009, 2011, 2016, 2018, 2019, 2020
- 2006 Beale-Orchard-Hays prize (with N. V. Sahinidis) for the paper "A polyhedral branch-and-cut approach to global optimization"
- Krannert Faculty Fellow, 2006
- Best Paper Award (with K. Kannan and P. De) in the fifteenth Workshop on Information Technologies and Systems (2005) for the paper "A Mechanism for Allocating Objects in a Network of Symmetric Caches"
- Honorable Mention in 2005 Junior Faculty Interest Group Competition (with Y. Li) for the paper "Minimizing Flow Disruption due to Network Maintenance"
- Distinguished Core MBA Teaching Recognition, 2005–2011, 2014–2020
- Distinguished Elective MBA Teaching Recognition, 2014–2019
- INFORMS Computing Society Prize (with N. V. Sahinidis), 2004 for research excellence in the interface between Computer Science and Operations Research
- Jay N. Ross Young Faculty Scholar Award, 2002–2003, Purdue University
- American Institute of Chemical Engineers (AICHE) Computers and Systems Technology (CAST) Director's Award, 1999. Best Poster: Novel Molecular Designs Via Global Optimization
- CSE Fellow, Computational Science & Engineering, University of Illinois, Jan 1999–May 1999
- Teaching Fellow, Department of Mechanical and Industrial Engineering, University of Illinois, Aug 1998–May 1999
- Tata Consultancy Services award for *best project* in the areas of CAD/CAM, Robotics & Automation, July 1993

Grants

- PI, Air Force Office of Scientific Research, Quantifying Probabilities using Optimization Techniques, $378,105, January 2022-January 2025
- PI, National Science Foundation, Collaborative Research: Novel Relaxations for Cardinality-Constrained Optimization Problems with Applications in Network Interdiction and Data Analysis, $396,424, August 2017-July 2021
- Co-PI, National Science Foundation, CNS Core: Small: Designing Networks for Stringent Performance Requirements, $500,000, October 2019-September 2022
- PI, National Science Foundation, Collaborative Research: Novel Relaxations for Cardinality-Constrained Optimization Problems with Applications in Network Interdiction and Data Analysis, $396,424, August 2017-July 2021
- Co-PI, Optimization of Oil/Gas Processes and Process Flowsheets, Exxon Mobil Research Company, $638,685, March 2017-February 2020
- Co-PI, Development of method and algorithms to identify easily implementable energy efficient low-cost multicomponent distillation column trains with energy savings for wide number of separations, $1,151,707 (Department of Energy Share: $900,000, Purdue Cost Share: $251,707) December 2014-December 2017
- Co-PI, Multicomponent Distillation Configurations, Eastman Chemical Company, $45,000
- PI, National Science Foundation, Collaborative Research: Novel Tighter Relaxations for Complementarity Constraints with Applications to Nonlinear and Bilevel Programming, $226,172, September 2012–August 2015

- Co-PI, National Science Foundation, CSR: Medium: Collaborative Research: Architecting Performance Sensitive Applications for the Cloud, $400000, August 2012–July 2016
- PI, National Science Foundation, Collaborative Research: Generating Strong Cuts for Nonlinear Programs Via Orthogonal Disjunctions and Lifting Techniques, $204171, July 2009–June 2013
- Amazon.com, $25000 (with Prof. K. Tang), Evidence Based Solutions for Global Fulfillment Network, June 2007
- Huntingburg OFS project under Global Supply Chain Management Initiative, June 2006
- Purdue Research Foundation Summer Faculty Grant, Relaxation Hierarchies and Continuous Lifting in Deterministic Global Optimization, 2006
- Purdue Research Foundation Summer Faculty Grant, Disjunctive Relaxations of Non-convex Nonlinear Programs, 2005

Professional Memberships

- Member of Institute of Operations Research and Management Science since 1996
- Member of Mathematical Programming/Optimization Society 2003-2006, 2015-present
- Web Administrator of Optimization Section of Institute for Operations Research and Management Science 1996-2001

Service

- Quantitative Methods Area Coordinator, 2020-till date
- PhD Committee, 2018-2019
- Data Science Initiative, Faculty Representative, 2017-2018
- Co-director, Business Information and Analytics Center, 2016-2018
- Co-director, MS in Business Analytics and Information Management, 2015-2018
- STAMINA IT/Analytics Case Competition, Judge, 2016, 2017
- Krannert delegate for Associate Deans for Research Meetings, 2015-till date
- MBA Review Committee, 2015-2016
- Krannert Masters Committee, 2015-2016
- Star Committee, 2013-2014
- Design Committee for MS in Business Analytics and Information Management, 2012-2015
- Reviewer for Big Ideas Challenge. Purdue University, 2016-2017
- Graduate Council, 2009-2012
- PhD Advisor for Quantitative Methods, 2007-till date
- Restructuring Committee for Quantitative Methods PhD Program, 2007-2008
- Opportunity Day, Analytical Consulting, Presenter, 2009-2012
- Katalyst/Blackboard Vista Transition Working Group, 2007-2008
- PhD Recruitment Committee for Quantitative Methods, 2002-till date
- Faculty Grievance Committee, 2004-2007
- Panel Discussant and Presenter at Research and Teaching Worshop for New Faculty, 2007, 2008
- Information Technology Access Committee, Chair, 2007-2008
- DCCME/GSCMI Advisory Committee, 2005-2010
- Undergraduate Task Force, 2005-2006
- Undergraduate Curriculum Committee, 2004-2005
- Information Technology Access Committee, Member 2002-2008
- Faculty Search Committee, Chair 2010-2011

- Faculty Search Committee, Member 2002-2003, 2010-2011, 2012-2013, 2014-2015
- KGSA interclub competition judge, 2008

Professional Activities

- Editorial Boards: Associate Editor, *Journal of Global Optimization*, Associate Editor, *Mathematical Programming Computation*, Associate Editor, *Operations Research Forum*
- Nicholson Award Committee, 2021
- Optimization Society Student Paper Prize, Chair, 2015
- Optimization Society Student Paper Prize, Member, 2015-2016
- Contributing Author for Global Optimization, NEOS Wiki 2011
- Cluster Chair for Global Optimization, International Symposium on Mathematical Programming, 2015
- Program Committee, 2011 INFORMS Midwest Meeting, 2011
- Program Committee, 2009 CPAIOR International Meeting, Pittsburgh, 2009
- Organized the Global Optimization Cluster for ICCOPT-MOPTA, Hamilton, 2007
- Organized the Global Optimization Cluster for INFORMS, Pittsburgh, 2006
- Organized the Global Optimization Cluster for INFORMS, San Francisco, 2005
- Vice Chair of Global Optimization, INFORMS Optimization Society, October 2004 to November 2006
- Refereed papers for *Computers and Chemical Engineering*, *Computational Optimization and Applications*, *Discrete Optimization*, *European Journal of Operational Research*, *International Journal of Operations and Quantitative Management*, *International Journal of Systems Science*, *Journal of Global Optimization*, *Journal of Industrial and Management Optimization*, *Journal of Optimization Theory and Applications*, *Management Science*, *Mathematical Programming*, *Operations Research*, *Operations Research Letters*, *Optimization and Engineering*, *Optimization Methods and Software*, and *SIAM Journal on Optimization*.
- Developed and Maintained Web Interface for BARON, October 1999–May 2001
- Organized Paper Sessions in INFORMS, Miami, 2001, INFORMS, San Jose, 2002, INFORMS Optimization Society Meeting, Atlanta, 2008, and INFORMS, Washington DC, 2008.