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

Executive Associate Dean of Faculty, Mitch Daniels School of Business, July 2024 - present

Acting Executive Associate Dean of Faculty, Mitch Daniels School of Business, September 2023 - June 2024

Interim Dean, Mitch Daniels School of Business, July 2023 - August 2023

Director, Krenicki Center for Business Analytics and Machine Learning July 2022 - present

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

Professor of Chemical Engineering (by Courtesy), Purdue University, April 2022 - present

Professor (with tenure), Purdue University, August 2012 - present

Associate Professor (with tenure), 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

Leadership Activities

Executive Associate Dean of Faculty, Mitch Daniels School of Business, July 2024-present

- Led restructuring the Mitch Daniels School of Business from 2 departments to 9 departments
- Represent DSB as Associate Dean for Research and Associate Dean for Faculty Affairs
- Led senior hiring program

- Organized the named and distinguished professor committee
- Led the awards and books initiative
- Streamlined and automated process operations such as voting and research tracking

Acting Executive Associate Dean of Faculty, Mitch Daniels School of Business, September 2023–June 2024

- Represent DSB as Associate Dean for Research and Associate Dean for Faculty Affairs
- Initiated various joint degree program initiatives
- Chaired area promotion committee for School of Business
- Faculty hiring initiative
- Allocation of PhD and Faculty lines across departments and areas
- Secure faculty for executive education across campus
- Direct suitable engagement opportunities from campus to relevant faculty

Interim Dean, Mitch Daniels School of Business, July 2023 – August 2023

- Request for faculty positions
- Developed a growth model for teaching needs
- Instituted Dean's Distinguished Lecture Series
- Transitioning new dean

Director of Krenicki Center for Business Analytics and Machine Learning, 2022–present

- Co-organizer of Data for Good Gala celebrating INFORMS UPS George D. Smith Prize
- Co-organizer for Statistics and Optimization in Data Science Workshop
- Helped organize Purdue Student Lab with AT Kearney.
- Chaired the design of a PhD program in Business Analytics & Data Science
- Establish and manage consulting engagements with several leading companies
- Co-crafted a proposal for the New School of Business at Purdue

Area Head, Quantitative Methods, 2020–2023

- Led the team that won the INFORMS UPS George D. Smith Prize for Business Analytics and Information Management programs
- Hired faculty with analytics research with varied terminal degrees
- Planned area growth strategy, teaching activities, and managed area budgets
- Managed multiple program starts and dynamic scheduling during COVID-19 pandemic
- Helped develop consensus for an A journal list

Chair, Bachelors Program in Business Analytics and Information Management 2020-2021

- Designed the undergraduate degree program; helped create classes to fill gaps; introduced new lab classes during sophomore year for early engagement with analytics
- the first cohort consists of over 110 students; including students that changed their degree there are 180+ students in the program

Founding director, Masters in Business Analytics and Information Management 2014–2018

- Designed program and obtained STEM certification by helping create a new process for majors at Purdue University
- Grew the program from 21 to 83 students in its third year of inception

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, data science, process sytems, and network models 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

1. Tawarmalani, M., & Sahinidis, N. V. (2002). *Convexification and global optimization in continuous and mixed-integer nonlinear programming: Theory, algorithms, software, and applications*. Springer Science & Business Media.

Journal Publications

1. Nogaja, A. S., Tawarmalani, M., & Agrawal, R. (2025, accepted). A computationally efficient heat pump model for quick and reliable identification of energy-efficient distillation configurations. *Chemical Engineering Science*, 122707.
2. Jiang, Z., Tawarmalani, M., & Agrawal, R. (2025). Minimum reflux calculation for multicomponent distillation in multi-feed, multi-product columns: Algorithms and examples. *AIChE Journal*, e70016.
3. Nogaja, A. S., Tawarmalani, M., & Agrawal, R. (2025). Comparing exergy and heat pump work in distillation systems. *AIChE Journal*, e18895.
4. Kim, J., Richard, J.-P. P., & Tawarmalani, M. (2025). A reciprocity between tree ensemble optimization and multilinear optimization. *Operations Research*, *73*, 2610–2626.
5. He, T., Liu, S., & Tawarmalani, M. (2025). Convexification techniques for fractional programs. *Mathematical Programming*, *213*, 107–149.
6. Nogaja, A., Tawarmalani, M., & Agrawal, R. (2024). Cogeneration improves separation efficiency. *Industrial and Engineering Chemistry Research*, *63*, 18564–18574.

7. He, T., & Tawarmalani, M. (2024). MIP relaxations in factorable programming. *SIAM Journal on Optimization*, *34*, 2856–2882.

8. Kim, J., Richard, J.-P. P., & Tawarmalani, M. (2024). Piecewise polyhedral relaxations of multilinear optimization. *SIAM Journal on Optimization*, *34*, 3167–3193.

9. Gooty, R. T., Agrawal, R., & Tawarmalani, M. (2024). Advances in MINLP to identify energy-efficient distillation configurations. *Operations Research*, *72*, 639–659.

10. Chen, Z., Tawarmalani, M., & Agrawal, R. (2024). Global minimization of power consumptions for multicomponent gas membrane cascades. *Computers & Chemical Engineering*, *180*, 108464.

11. Mathew, T. J., Narayanan, S., Jalan, A., Matthews, L. R., Gupta, H., Billimoria, R., Pereira, C. S., Goheen, C., Tawarmalani, M., & Agrawal, R. (2024). Optimization of distillation configurations for multicomponent-product distillations. *Computers & Chemical Engineering*, 108628.

12. Mathew, T. J., Tawarmalani, M., & Agrawal, R. (2023). Relaxing the constant molar overflow assumption in distillation optimization. *AIChE Journal*, *69*(9), e18125.

13. Gooty, R. T., Mathew, T. J., Tawarmalani, M., & Agrawal, R. (2023). An MINLP formulation to identify thermodynamically-efficient distillation configurations. *Computers & Chemical Engineering*, *178*, 108369.

14. He, T., & Tawarmalani, M. (2022). Tractable relaxations of composite functions. *Mathematics of Operations Research*, *47*(2), 1110–1140.

15. Kim, J., Tawarmalani, M., & Richard, J.-P. P. (2022). Convexification of permutation-invariant sets and an application to sparse principal component analysis. *Mathematics of Operations Research*, *47*(4), 2547–2584.

16. Chandra, A., & Tawarmalani, M. (2022). Probability estimation via policy restrictions, convexification, and approximate sampling. *Mathematical Programming*, *196*(1), 309–345.

17. Chavez Velasco, J. A., Tawarmalani, M., & Agrawal, R. (2022). Which separation scenarios are advantageous for membranes or distillations? *AIChE Journal*, *68*(11), e17839.

18. Nogaja, A. S., Mathew, T. J., Tawarmalani, M., & Agrawal, R. (2022). Identifying heat-integrated energy-efficient multicomponent distillation configurations. *Industrial & Engineering Chemistry Research*, *61*(37), 13984–13995.

19. Jiang, Z., Tawarmalani, M., & Agrawal, R. (2022). Minimum reflux calculation for multi-component distillation in multi-feed, multi-product columns: Mathematical model. *AIChE Journal*, *68*(12), e17929.

20. Mathew, T. J., Narayanan, S., Jalan, A., Matthews, L., Gupta, H., Billimoria, R., Pereira, C. S., Goheen, C., Tawarmalani, M., & Agrawal, R. (2022). Advances in distillation: Significant reductions in energy consumption and carbon dioxide emissions for crude oil separation. *Joule*, *6*(11), 2500–2512.

21. Nguyen, T. T., Richard, J.-P. P., & Tawarmalani, M. (2021). Convexification techniques for linear complementarity constraints. *Journal of Global Optimization*, *80*, 249–286.

22. He, T., & Tawarmalani, M. (2021). A new framework to relax composite functions in nonlinear programs. *Mathematical Programming*, *190*, 427–466.

23. Chavez Velasco, J. A., Tawarmalani, M., & Agrawal, R. (2021). Systematic analysis reveals thermal separations are not necessarily most energy intensive. *Joule*, *5*(2), 330–343.

24. Chavez Velasco, J. A., Gooty, R. T., Tawarmalani, M., & Agrawal, R. (2021). Optimal design of membrane cascades for gaseous and liquid mixtures via MINLP. *Journal of Membrane Science*, *636*, 119514.

25. Mathew, T. J., Tumbalam Gooty, R., Tawarmalani, M., & Agrawal, R. (2021). A simple criterion for feasibility of heat integration between distillation streams based on relative volatilities. *Industrial & Engineering Chemistry Research*, *60*(28), 10286–10302.

26. Kim, J., Tawarmalani, M., & Richard, J.-P. P. (2019). On cutting planes for cardinality-constrained linear programs. *Mathematical Programming*, *178*, 417–448.

27. Wu, J., Tawarmalani, M., & Kannan, K. N. (2019). Cardinality bundling with Spence–Mirrlees reservation prices. *Management Science*, *65*(4), 1891–1908.

28. Gooty, R. T., Agrawal, R., & Tawarmalani, M. (2019). An MINLP formulation for the optimization of multicomponent distillation configurations. *Computers & Chemical Engineering*, *125*, 13–30.

29. Jiang, Z., Mathew, T. J., Zhang, H., Huff, J., Nallasivam, U., Tawarmalani, M., & Agrawal, R. (2019). Global optimization of multicomponent distillation configurations: Global minimization of total cost for multicomponent mixture separations. *Computers & Chemical Engineering*, *126*, 249–262.

30. Jiang, Z., Chen, Z., Huff, J., Shenvi, A. A., Tawarmalani, M., & Agrawal, R. (2019). Global minimization of total exergy loss of multicomponent distillation configurations. *AIChE Journal*, *65*(11), e16737.

31. Mathew, T. J., Tumbalam Gooty, R., Tawarmalani, M., & Agrawal, R. (2019). 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.

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

33. Nguyen, T. T., Richard, J.-P. P., & Tawarmalani, M. (2018). Deriving convex hulls through lifting and projection. *Mathematical Programming*, *169*, 377–415.

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

35. Jiang, Z., Ramapriya, G. M., Tawarmalani, M., & Agrawal, R. (2018). Minimum energy of multicomponent distillation systems using minimum additional heat and mass integration sections. *AIChE Journal*, *64*(9), 3410–3418.

36. Ramapriya, G. M., Selvarajah, A., Jimenez Cucaita, L. E., Huff, J., Tawarmalani, M., & Agrawal, R. (2018). Short-cut methods versus rigorous methods for performance-evaluation of distillation configurations. *Industrial & Engineering Chemistry Research*, *57*(22), 7726–7731.

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

38. Kannan, K., Rahman, M. S., & Tawarmalani, M. (2016). Economic and policy implications of restricted patch distribution. *Management Science*, *62*(11), 3161–3182.

39. Ramapriya, G. M., Tawarmalani, M., & Agrawal, R. (2016). Thermal coupling links to liquid-only transfer streams: An enumeration method for new FTC dividing wall columns. *AIChE Journal*, *62*(4), 1200–1211.

40. Nallasivam, U., Shah, V. H., Shenvi, A. A., Huff, J., Tawarmalani, M., & Agrawal, R. (2016). Global optimization of multicomponent distillation configurations: 2. Enumeration based global minimization algorithm. *AIChE Journal*, *62*(6), 2071–2086.

41. Bao, X., Khajavirad, A., Sahinidis, N. V., & Tawarmalani, M. (2015). Global optimization of nonconvex problems with multilinear intermediates. *Mathematical Programming Computation*, *7*(1), 1–37.

42. Ramapriya, G. M., Shenvi, A. A., Tawarmalani, M., & Agrawal, R. (2015). A new framework for combining a condenser and reboiler in a configuration to consolidate distillation columns. *Industrial & Engineering Chemistry Research*, *54*(42), 10449–10464.

43. Gençer, E., Mallapragada, D. S., Maréchal, F., Tawarmalani, M., & Agrawal, R. (2015). 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*, *112*(52), 15821–15826.

44. Chung, K., Richard, J.-P. P., & Tawarmalani, M. (2014). Lifted inequalities for 0-1 mixed-integer bilinear covering sets. *Mathematical Programming*, *145*(1), 403–450.

45. Ramapriya, G. M., Tawarmalani, M., & Agrawal, R. (2014). Modified basic distillation configurations with intermediate sections for energy savings. *AIChE Journal*, *60*(3), 1091–1097.

46. Mallapragada, D. S., Tawarmalani, M., & Agrawal, R. (2014). Synthesis of augmented biofuel processes using solar energy. *AIChE Journal*, *60*(7), 2533–2545.

47. Ramapriya, G. M., Tawarmalani, M., & Agrawal, R. (2014). Thermal coupling links to liquid-only transfer streams: A path for new dividing wall columns. *AIChE Journal*, *60*(8), 2949–2961.

48. Tawarmalani, M., Richard, J.-P. P., & Xiong, C. (2013). Explicit convex and concave envelopes through polyhedral subdivisions. *Mathematical Programming*, *138*(1), 531–577.

49. Nallasivam, U., Shah, V. H., Shenvi, A. A., Tawarmalani, M., & Agrawal, R. (2013). Global optimization of multicomponent distillation configurations: 1. Need for a reliable global optimization algorithm. *AIChE Journal*, *59*(3), 971–981.

50. Bao, X., Sahinidis, N. V., & Tawarmalani, M. (2011). Semidefinite relaxations for quadratically constrained quadratic programming: A review and comparisons. *Mathematical Programming*, *129*, 129–157.

51. Tawarmalani, M., & Li, Y. (2011). Multi-period maintenance scheduling of tree networks with minimum flow disruption. *Naval Research Logistics*, *58*(5), 507–530.

52. Richard, J.-P. P., & Tawarmalani, M. (2010). Lifting inequalities: A framework for generating strong cuts for nonlinear programs. *Mathematical Programming*, *121*, 61–104.

53. Tawarmalani, M., Richard, J.-P. P., & Chung, K. (2010). Strong valid inequalities for orthogonal disjunctions and bilinear covering sets. *Mathematical Programming*, *124*(1), 481–512.

54. Bao, X., Sahinidis, N. V., & Tawarmalani, M. (2009). Multiterm polyhedral relaxations for nonconvex, quadratically constrained quadratic programs. *Optimization Methods & Software*, *24*(4-5), 485–504.

55. Tawarmalani, M., Kannan, K., & De, P. (2009). Allocating objects in a network of caches: Centralized and decentralized analyses. *Management Science*, *55*(1), 132–147.

56. Tawarmalani, M., & Sahinidis, N. V. (2005). A polyhedral branch-and-cut approach to global optimization. *Mathematical Programming*, *103*(2), 225–249.

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

58. Tawarmalani, M., & Sahinidis, N. V. (2004). Global optimization of mixed-integer nonlinear programs: A theoretical and computational study. *Mathematical Programming*, *99*(3), 563–591.

59. Ahmed, S., Tawarmalani, M., & Sahinidis, N. V. (2004). A finite branch-and-bound algorithm for two-stage stochastic integer programs. *Mathematical Programming*, *100*(2), 355–377.

60. Sahinidis, N. V., Tawarmalani, M., & Yu, M. (2003). Design of alternative refrigerants via global optimization. *AIChE Journal*, *49*(7), 1761–1775.

61. Tawarmalani, M., & Sahinidis, N. V. (2002). Convex extensions and envelopes of lower semi-continuous functions. *Mathematical Programming*, *93*(2), 247–263.

62. Tawarmalani, M., Ahmed, S., & Sahinidis, N. V. (2002). Global optimization of 0-1 hyperbolic programs. *Journal of Global Optimization*, *24*(4), 385–416.

63. Tawarmalani, M., & Sahinidis, N. V. (2001). Semidefinite relaxations of fractional programs via novel convexification techniques. *Journal of Global Optimization*, *20*, 133–154.

64. Tawarmalani, M., Ahmed, S., & Sahinidis, N. V. (2001). Product disaggregation in global optimization and relaxations of rational programs. *Optimization and Engineering*, *3*, 281–303.

65. Sahinidis, N. V., & Tawarmalani, M. (2000). Applications of global optimization to process and molecular design. *Computers & Chemical Engineering*, *24*(9-10), 2157–2169.

66. Adhya, N., Tawarmalani, M., & Sahinidis, N. V. (1999). A lagrangian approach to the pooling problem. *Industrial & Engineering Chemistry Research*, *38*(5), 1956–1972.

Trade Publications

1. Mathew, T. J., Gooty, R. T., Tawarmalani, M., & Agrawal, R. (2020). Quickly assess distillation columns. *Chemical Engineering Progress*, *116*(12), 27–34. https://www.aiche.org/resources/publications/cep/2020/december/quickly-assess-distillation-columns

Refereed Book Chapters

1. Tawarmalani, M., & Sahinidis, N. V. (2009). Time-dependent traveling salesman problem.

In C. A. Floudas & P. M. Pardalos (Eds.), *Encyclopedia of optimization* (pp. 3902–3908). Springer US.

2. Tawarmalani, M., & Sahinidis, N. V. (2002). Exact algorithms for global optimization of mixed-integer nonlinear programs. In *Handbook of global optimization: Volume 2* (pp. 65–85). Springer US Boston, MA.

Refereed Conference Proceedings

1. AlQiam, A. A., Li, Z., Ahuja, S. S., Wang, Z., Zhang, Y., Rao, S. G., Ribeiro, B., & Tawarmalani, M. (2025). Hattrick: Solving multi-class TE using neural models. *Proceedings of the ACM SIGCOMM 2025 Conference*, 264–278.

2. Nagoja, A., Tawarmalani, M., & Agrawal, R. (2024). An MINLP formulation for global optimization of heat integration-heat pump assisted distillations. *Proceedings of the 10th International Conference on Foundations of Computer-Aided Process Design*.

3. AlQiam, A. A., Yao, Y., Wang, Z., Ahuja, S. S., Zhang, Y., Rao, S. G., Ribeiro, B., & Tawarmalani, M. (2024). Transferable neural WAN TE for changing topologies. *Proceedings of the ACM SIGCOMM 2024 Conference*, 86–102.

4. Jafri, S. U., Rao, S., Shrivastav, V., & Tawarmalani, M. (2024). Leo: Online ML-based traffic classification at Multi-Terabit line rate. *21st USENIX Symposium on Networked Systems Design and Implementation (NSDI 24)*, 1573–1591. https://www.usenix.org/conference/nsdi24/presentation/jafri

5. Jiang, C., Li, Z., Rao, S., & Tawarmalani, M. (2022). Flexile: Meeting bandwidth objectives almost always. *Proceedings of the 18th International Conference on Emerging Networking Experiments and Technologies*, 110–125.

6. Mathew, T. J., Tawarmalani, M., & Agrawal, R. (2022). Systematically identifying energy-efficient and attractive multicomponent distillation configurations. In *Computer aided chemical engineering* (Vol. 49, pp. 637–642). Elsevier.

7. Chavez Velasco, J. A., Chen, Z., Gooty, R. T., Tawarmalani, M., & Agrawal, R. (2021). Energy-efficient membrane cascades for industrial separations. In *Computer aided chemical engineering* (Vol. 50, pp. 359–364). Elsevier.

8. Jiang, C., Rao, S., & Tawarmalani, M. (2020). 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*, 139–153.

9. Chang, Y., Jiang, C., Chandra, A., Rao, S., & Tawarmalani, M. (2019). Lancet: Better network resilience by designing for pruned failure sets. *Proceedings of the ACM on Measurement and Analysis of Computing Systems*, *3*, 1–26.

10. Gooty, R. T., Mobed, P., Tawarmalani, M., & Agrawal, R. (2018). Optimal multicomponent distillation column sequencing: Software and case studies. In *Computer aided chemical engineering* (Vol. 44, pp. 223–228). Elsevier.

11. Jiang, Z., Ramapriya, G. M., Tawarmalani, M., & Agrawal, R. (2018). Process intensification in multicomponent distillation. *Chemical Engineering Transactions*, *69*, 841–846.

12. Chang, Y., Rao, S., & Tawarmalani, M. (2017). Robust validation of network designs under uncertain demands and failures. *14th USENIX Symposium on Networked Systems Design and Implementation (NSDI 17)*, 347–362. https://www.usenix.org/conference/nsdi17/technical-sessions/presentation/chang

13. Barik, A., Honorio, J., & Tawarmalani, M. (2017). Information theoretic limits for linear prediction with graph-structured sparsity. *2017 IEEE International Symposium on Information Theory (ISIT)*, 2348–2352.

14. Gençer, E., Tawarmalani, M., & Agrawal, R. (2015). Integrated solar thermal hydrogen and power coproduction process for continuous power supply and production of chemicals. In *Computer aided chemical engineering* (Vol. 37, pp. 2291–2296). Elsevier.

15. Shankaranarayanan, P., Sivakumar, A., Rao, S., & Tawarmalani, M. (2014). Performance sensitive replication in geo-distributed cloud datastores. *2014 44th Annual IEEE/IFIP International Conference on Dependable Systems and Networks*, 240–251.

16. Gençer, E., Mallapragada, D., Tawarmalani, M., & Agrawal, R. (2014). Synergistic biomass and natural gas conversion to liquid fuel with reduced CO2 emissions. In *Computer aided chemical engineering* (Vol. 34, pp. 525–530). Elsevier.

17. Ramapriya, G. M., Tawarmalani, M., & Agrawal, R. (2014). New, useful dividing wall columns for sustainable distillation. *Book of Full Papers (Proceedings): 10th International Conference on Distillation & Absorption*, 76–81.

18. Nguyen, T. T., Tawarmalani, M., & Richard, J.-P. P. (2011). Convexification techniques for linear complementarity constraints. *International Conference on Integer Programming and Combinatorial Optimization*, 336–348.

19. Hajjat, M., Sun, X., Sung, Y.-W. E., Maltz, D., Rao, S., Sripanidkulchai, K., & Tawarmalani, M. (2010). Cloudward bound: Planning for beneficial migration of enterprise applications to the cloud. *ACM SIGCOMM Computer Communication Review*, *40*(4), 243–254.

20. Rahman, M. S., Kannan, K. N., & Tawarmalani, M. (2007). The countervailing incentive of restricted patch distribution: Economic and policy implications. *WEIS*. https://econinfosec.org/archive/weis2007/program.htm

21. Xia, Q., Ersoy, O., Moskowitz, H., & Tawarmalani, M. (2007). Interactive clustering and classification. *Proceedings of Conf. Artificial Neural Networks in Eng., (ANNIE'08)*, 463–470.

22. Tawarmalani, M., Kannan, K. N., & De, P. (2005). A mechanism for allocating objects in a network of symmetric caches. *15th Annual Workshop on Information Technolgies & Systems (WITS) Paper*.

Presentations

1. Calmon, Andre, Hall, G., Blaettchen, P., & Tawarmalani, M. (2026). *From trees to treewidth: Inventory management in complex supply chain networks.* INFORMS Optimization Conference, Atlanta.

2. Wang, C., Richard, J. P.-P., & Tawarmalani, M. (2026). *New convexification techniques for graphical decision models.* INFORMS Optimization Conference, Atlanta.

3. Tawarmalani, M., Zhu, Haisheng, & He, T. (2026). *MINLP relaxations using computational geometry tools.* INFORMS Optimization Conference, Atlanta.

4. Nogaja, A., Tawarmalani, M., & Agrawal, R. (2025). *Application of exergy optimization to design efficient processes with electrified process heating.* AIChE, Boston.

5. Kadu, P., Nogaja, A., Tawarmalani, M., & Agrawal, R. (2025). *Identifying the simpler and energy efficient dividing wall configurations.* AIChE, Boston.

6. Zhu, H., He, T., & Tawarmalani, M. (2025). *Revisiting composite relaxations from a lifting lens.* INFORMS, Atlanta.

7. Tawarmalani, M., & Oh, H.-J. (2025). *On disjoint bilinear programs.* 2025 Mathematical Optimization Program Review, AFOSR, Washington DC.

8. Tawarmalani, M. (2025). *New hierarchies for disjoint bilinear programs.* ICCOPT, Los Angeles.

9. AlQiam, A. A., Li, Z., Ahuja, S. S., Wang, Z., Zhang, Y., Rao, S. G., Ribeiro, B., & Tawarmalani, M. (2025). *Hattrick: Solving multi-class TE using neural models.* SIGCOMM, Portugal.

10. He, T., & Tawarmalani, M. (2025). *Discrete nonlinear functions: Formulations and applications.* ICCOPT, Los Angeles.

11. Tawarmalani, M. (2024). *New relaxation hierarchy for disjoint bilinear programs.* Panos-70 conference, Greece.

12. Tawarmalani, M. (2024). *New finite relaxations hierarchies for disjoint bilinear programs.* Discrete Optimization: Mathematics, Algorithms, and Computation, ICERM, Providence.

13. Tawarmalani, M. (2024). *New hierarchies for disjoint bilinear programs.* 2024 Mathematical Optimization Program Review, AFOSR, Washington DC.

14. Tawarmalani, M. (2024). *New finite hierarchy for disjoint bilinear programs.* INFORMS, Seattle.

15. Tawarmalani, M., Kim, J., & Richard, J.-P. P. (2024). *Piecewise polyhedral relaxations of multilinear optimization.* ISMP, Montreal.

16. Bhattacharya, R., Nguyen, T., Sun, W. W., & Tawarmalani, M. (2024). *Active learning for fair and stable online allocations.* ACM EC 2024, New Haven, CT.

17. AlQiam, A. A., Yao, Y., Wang, Z., Ahuja, S. S., Zhang, Y., Rao, S. G., Ribeiro, B., & Tawarmalani, M. (2024). *Transferable neural WAN TE for changing topologies.* ACM SIGCOMM 2024, Sydney.

18. Nogaja, A., Tawarmalani, M., & Agrawal, R. (2024). *Systematic workflow to design electrified distillation systems for binary and ternary separations.* AIChE 2024 Spring Meeting & 20th Global Congress on Process Safety.

19. Jafri, S. U., Rao, S., Shrivastav, V., & Tawarmalani, M. (2024). *Leo: Online ML-based traffic classification at multi-terabit line rate.* NSDI '24, Santa Clara.

20. Nagoja, A., Tawarmalani, M., & Agrawal, R. (2023). *Heat pumps for electrification of multicomponent distillation trains: An MINLP formulation.* AIChE Annual Meeting, Orlando.

21. Velasco, J. A. C., Gooty, R. T., Tawarmalani, M., & Agrawal, R. (2023). *Which separation process to use: Membrane or distillation or both?* AIChE Annual Meeting, Orlando.

22. Tawarmalani, M., & Lanham, M. (2023). *UPS George D. Smith winner reprise.* INFORMS Annual Meeting, Phoenix.

23. Tawarmalani, M., He, T., & Liu, S. (2023). *Convexification techniques for fractional programs.* INFORMS Annual Meeting, Phoenix.

24. Oh, H.-J. (2023). *Solution of disjoint bilinear programs using simplicial branch-and-bound.* INFORMS Annual Meeting, Phoenix.

25. Richard, J.-P. P., Tawarmalani, M., & Kim, J. (2023). *Convexification techniques for logical implication constraints involving cardinality requirements.* INFORMS Annual Meeting, Phoenix.

26. Chandra, A., & Tawarmalani, M. (2023). *Risk minimization for network traffic engineering.* INFORMS Annual Meeting, Phoenix.

27. Tawarmalani, M., He, T., & Liu, S. (2023). *Convexficiation techniques for fractional programs, a hatchery of modern mathematics.* Oberwolfach, Germany; Mathematical Research Institute of Oberwolfach.

28. Tawarmalani, M., & Chandra, A. (2023). *Probability quantification and optimization with chance-constraints for network routing.* SIAM conference on optimization, Seattle.

29. Liu, S., He, T., & Tawarmalani, M. (2023). *Convexification techniques for 0-1 linear fractional programs.* SIAM conference on optimization, Seattle.

30. Tawarmalani, M., Lanham, M., Dejoie, R., Franta, J., Wang, Y., Crawford, J., Copas, K., & Reynolds, B. (2023). *UPS George D. Smith prize competition.* INFORMS Analytics, Aurora.

31. Tawarmalani, M., Kim, J., & Richard, J.-P. P. (2023). *Reciprocity between tree ensemble optimization and multilinear optimization, linear and non-linear mixed-integer optimization.* ICERM, Brown, Providence.

32. Richard, J.-P. P., Kim, J., & Tawarmalani, M. (2022). *A reciprocity between tree ensemble optimization and multilinear optimization.* MIP, Rutgers.

33. Chandra, A., & Tawarmalani, M. (2022). *Convex approximations of risk measures with applications to chance-constrained programming.* ICCOPT, Bethlehem.

34. Chandra, A., & Tawarmalani, M. (2022). *Convex approximations of risk measures with applications to chance-constrained programming.* INFORMS Annual Meeting, Indianapolis.

35. Mathew, T. J., Tawarmalani, M., & Agrawal, R. (2022). *Relaxing the constant relative volatilities and constant molar overflow assumptions in distillation while retaining their benefits.* AIChE Annual Meeting, New Orleans.

36. Varsha, V., Tawarmalani, M., Gitau, M. W., & Agrawal, R. (2022). *Developing optimization framework for sustainable co-production of food and energy.* AIChE Annual Meeting, New Orleans.

37. Chavez Velasco, J. A., Tawarmalani, M., & Agrawal, R. (2022). *Which separation method needs lower power: Membrane or distillation.* AIChE Annual Meeting, New Orleans.

38. Iyer, A., Lanham, M., David, A., Feng, Q., & Tawarmalani, M. (2022). *UPS George D. Smith prize competition.* INFORMS Analytics, Houston.

39. Kim, J., Tawarmalani, M., & Richard, J.-P. P. (2021). *On SDP relaxations for sparse principal component analysis.* INFORMS Annual Meeting, Anaheim.

40. Jiang, C., Rao, S., & Tawarmalani, M. (2021). *Resilient and flexible routing.* INFORMS Annual Meeting, Anaheim.

41. Kim, J., Richard, J.-P. P., & Tawarmalani, M. (2021). *A reciprocity between tree ensemble optimization and multilinear optimization over the cartesian product of simplices.* INFORMS Annual Meeting, Anaheim.

42. Chandra, A., & Tawarmalani, M. (2021). *Optimization for probability estimation and application to network reliability.* INFORMS Annual Meeting, Anaheim.

43. Oh, H.-J., & Tawarmalani, M. (2021). *Convexification of disjoint bilinear programs.* INFORMS Annual Meeting, Anaheim.

44. Tawarmalani, M., & Chandra, A. (2021). *Quantifying probabilities using optimization techniques.* SIAM conference on optimization.

45. Kim, J., Tawarmalani, M., & Richard, J.-P. P. (2021). *Decision forests and multilinear polytopes.* SIAM conference on optimization.

46. Kim, J., Taslimi, B., Richard, J.-P. P., & Tawarmalani, M. (2020). *A cutting plane for tree-ensembles optimization.* INFORMS Annual Meeting.

47. Richard, J.-P. P., Tawarmalani, M., & Kim, J. (2020). *Permutation invariance in 0-1 mixed integer programming.* INFORMS Annual Meeting.

48. Chandra, A., & Tawarmalani, M. (2020). *Optimization techniques for probability estimation.* INFORMS Annual Meeting.

49. Gooty, R. T., Agrawal, R., & Tawarmalani, M. (2020). *Energy-efficient disitillation configurations: Novel formulation, relaxations, and discretizations, CAST director's student presentation award finalists.* AICHE Annual Meeting.

50. Chen, Z., Gooty, R. T., Chavez Velasco, J. A., Tawarmalani, M., & Agrawal, R. (2020). *Global optimization of multicomponent membrane cascade.* AICHE Annual Meeting.

51. Chavez Velasco, J. A., Tawarmalani, M., & Agrawal, R. (2019). *A novel methodology to correctly compare the energy efficiency between membranes and distillation.* AIChE Annual Meeting, Orlando, FL.

52. Mathew, T., Jalan, A., Goheen, C., Kocis, G., Narayanan, S., Yang, L., Tawarmalani, M., & Agrawal, R. (2019). *Process conceptualization in a carbon-constrained world: Leveraging optimization and systems engineering to balance multiple objectives.* AIChE Annual Meeting, Orlando, FL.

53. Taslimi, B., Kim, J., Richard, J.-P. P., & Tawarmalani, M. (2019). *Computational evaluation of new mixed-integer programming models for tree ensembles optimization.* INFORMS Annual Meeting, Seattle.

54. Tawarmalani, M., & He, T. (2019). *New relaxations for composite functions.* CRM/DIMACS Workshop on Mixed-Integer Nonlinear Programming, Montreal.

55. Kim, J., Taslimi, B., Richard, J.-P. P., & Tawarmalani, M. (2019). *Polyhedral results for tree ensembles optimization.* INFORMS Annual Meeting, Seattle.

56. Tawarmalani, M., & He, T. (2019). *New relaxations for composite functions.* INFORMS Annual Meeting, Seattle.

57. Tawarmalani, M., & He, T. (2019). *New relaxations for composite functions, mixed integer nonlinear programming: A hatchery of modern mathematics.* Oberwolfach, Germany; Mathematical Research Institute of Oberwolfach.

58. Tawarmalani, M., & He, T. (2019). *New relaxations for composite functions, los alamos national laboratory.* Los Alamos, NM.

59. Gooty, R. T., Agrawal, R., & Tawarmalani, M. (2018). *On piecewise under- and over-estimators of fractional terms.* AIChE Annual Meeting, Salt Lake City.

60. Jiang, Z., Tawarmalani, M., & Agrawal, R. (2018). *Minimum reflux behavior of multicomponent mixture separation using complex distillation columns.* AIChE Annual Meeting, Salt Lake City.

61. Mathew, T. J., Gooty, R. T., Tawarmalani, M., & Agrawal, R. (2018). *Optimization of heat-integrated multicomponent distillation sequences.* AIChE Annual Meeting, Salt Lake City.

62. Gooty, R. T., Mathew, T. J., Tawarmalani, M., & Agrawal, R. (2018). *An MINLP formulation for the optimization of heat-pump assisted distillation configurations.* AIChE Annual Meeting, Salt Lake City.

63. Richard, J.-P. P., Kim, J., Taslimi, B., & Tawarmalani, M. (2018). *Computational evaluation of new models for tree ensembles optimization.* INFORMS Annual Meeting, Phoenix.

64. T., H., & Tawarmalani, M. (2018). *Mining expression trees to improve factorable relaxations.* INFORMS Annual Meeting, Phoenix.

65. He, T., & Tawarmalani, M. (2018). *New convexification techniques for nonconvex optimization.* INFORMS Optimization Society Conference, Denver.

66. Richard, J.-P. P., Taslimi, B., Kim, J., & Tawarmalani, M. (2018). *Computational evaluation of new MIP models for tree ensembles optimization.* ISMP, Bordeaux.

67. Tawarmalani, M., & He, T. (2018). *Product convexification: A new relaxation framework for nonconvex programs.* ISMP, Bordeaux.

68. Tawarmalani, M., & He, T. (2018). *Product convexification: A new relaxation framework for nonconvex programs.* Designing and Implementation Algorithms for Mixed-Integer Nonlinear Optimization, Dagstuhl Seminar.

69. Gooty, R. T., Mobed, P., Tawarmalani, M., & Agrawal, R. (2017). *A tightly constrained MINLP-based formulation for the identification of energy efficient distillation configurations.* AIChE Annual Meeting, Minneapolis.

70. Jiang, Z., Tawarmalani, M., & Agrawal, R. (2017). *Process intensification in multicomponent distillation.* AIChE Annual Meeting, Minneapolis.

71. Mobed, P., Jiang, Z., Mathew, T. J., Tawarmalani, M., & Agrawal, R. (2017). *Global minimization of multicomponent distillation configurations total cost.* AIChE Annual Meeting, Minneapolis.

72. Jiang, Z., Tawarmalani, M., & Agrawal, R. (2017). *A new minimum reflux calculation method for multiple-feed distillation columns distilling ideal multicomponent mixtures.* AIChE Annual Meeting, Minneapolis.

73. Ridha, T., Gençer, E., Li, Y., Tawarmalani, M., Delgass, W. N., Ribeiro, F., & Agrawal, R. (2017). *Upgrading fast-hydropyrolysis products of cellulose to higher molecular weight products using systems-level molecular mapping.* AIChE Annual Meeting, Minneapolis.

74. Tawarmalani, M., & He, T. (2017). *Product convexification: A new relaxation framework for nonconvex programs.* MIT OR Center.

75. Taotao, H., & Tawarmalani, M. (2017). *On relaxations of products of functions.* INFORMS Annual Meeting, Houston.

76. Tawarmalani, M., & Taotao, H. (2017). *Revisiting the factorable relaxation scheme.* SIAM Conference on Optimization, Vancouver.

77. Jiang, Z., Ramapriya, G. M., Gooty, R. T., Tawarmalani, M., & Agrawal, R. (2016). *A method for minimization of total exergy loss over the complete search space of regular distillation configurations.* AIChE Annual Meeting, San Francisco.

78. Jiang, Z., Ramapriya, G. M., Gooty, R. T., Tawarmalani, M., & Agrawal, R. (2016). *Process intensification of multicomponent distillation configurations using minimum additional number of heat and mass integrated sections.* AIChE Annual Meeting, San Francisco.

79. Gençer, E., Tawarmalani, M., & Agrawal, R. (2016). *Systematic process design strategies for efficient and synergistic integration of solar thermal hydrogen, electricity and fresh water production processes.* AIChe Annual Meeting, San Francisco.

80. Tao, J., Nguyen, T., & Tawarmalani, M. (2016). *An iterative rounding algorithm and almost feasibility for nonconvex optimization.* INFORMS Annual Meeting, Nashville.

81. He, T., & Tawarmalani, M. (2016). *On LP relaxations for nonlinear programs.* INFORMS Annual Meeting, Nashville.

82. Wu, J., Tawarmalani, M., & Kannan, K. (2016). *Cardinality bundling with complex costs.* INFORMS Annual Meeting, Nashville.

83. Tawarmalani, M., Kim, J., & Richard, J.-P. P. (2016). *Exploiting permutation-invariance to construct tight relaxations.* INFORMS Annual Meeting, Nashville.

84. Rao, S. G., Chang, Y., & Tawarmalani, M. (2016). *Robust network design with flexible routing.* NSF Algorithms in the Field Workshop on Algorithms for Software-Defined Networking, New Jersey.

85. Tawarmalani, M., Kim, J., & Richard, J.-P. P. (2016). *Exploiting permutation-invariance to construct tight relaxations.* MIP, Miami.

86. Ramapriya, G. M., Tawarmalani, M., & Agrawal, R. (2015). *A heat & mass integration approach to reduce capital and operating costs of a distillation configuration.* AIChE Annual Meeting, Salt Lake City.

87. Ramapriya, G. M., Tawarmalani, M., & Agrawal, R. (2015). *Efficient separation-process synthesis.* AIChE Annual Meeting, Salt Lake City.

88. Gençer, E., Tawarmalani, M., & Agrawal, R. (2015). *Integrated process design for efficient solar thermal hydrogen and power production.* AIChE Annual Meeting, Salt Lake City.

89. Kim, J., Richard, J.-P. P., & Tawarmalani, M. (2015). *Sparse principal component analysis (SPCA) via convexification.* INFORMS Annual Meeting, Philadelphia.

90. Davarnia, D., Richard, J.-P. P., & Tawarmalani, M. (2015). *Envelopes of bilinear functions over polytopes with application to network interdiction.* INFORMS Annual Meeting, Philadelphia.

91. Kim, J., Richard, J.-P. P., & Tawarmalani, M. (2015). *A cut generation procedure for cardinality constrained optimization problems (CCOP.* ISMP, Pittsburgh.

92. Davarnia, D., Richard, J.-P. P., & Tawarmalani, M. (2015). *Envelopes of bilinear functions over polytopes with applications to network interdiction.* ISMP, Pittsburgh.

93. Richard, J.-P. P., Davarnia, D., & Tawarmalani, M. (2015). *Improved formulations for network interdiction through envelopes of bilinear functions over polytopes.* MIP, Chicago.

94. Gençer, E., Tawarmalani, M., & Agrawal, R. (2015). *Efficient solar thermal integrated power and chemical production cycles for uninterrupted power supply.* AIChE Midwest Regional Conference, Chicago.

95. Gençer, E., Mallagragada, D., Tawarmalani, M., & Agrawal, R. (2014). *Synergistic biomass and natural gas process design for liquid fuel production with reduced CO2 emissions.* AIChE Annual Meeting, Atlanta.

96. Ramapriya, G. M., Tawarmalani, M., & Agrawal, R. (2014). *Plethora of dividing wall columns for fully thermally coupled distillation.* AIChE Annual Meeting, Atlanta.

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

98. Tawarmalani, M., & Richard, J.-P. P. (2014). *Techniques in convexification of separable polynomial inequalities.* INFORMS Annual Meeting, San Francisco.

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

100. Kim, J., Richard, J.-P. P., & Tawarmalani, M. (2014). *On cutting planes for cardinality constrained optimization problems.* INFORMS Annual Meeting, San Francisco.

101. Davarnia, D., Richard, J.-P. P., & Tawarmalani, M. (2014). *On convex relaxations of network interdiction problems.* INFORMS Annual Meeting, San Francisco.

102. Wu, J., Kannan, K., & Tawarmalani, M. (2014). *Cardinality bundling with constrained prices.* INFORMS Annual Meeting, San Francisco.

103. Kannan, K., Tawarmalani, M., & Wu, J. (2014). *Cardinality bundles with constrained prices.* 8th China Workshop on Information Management, Chengdu, China.

104. Tawarmalani, M., & Richard, J.-P. P. (2014). *Decomposition techniques in convexification of separable polynomial inequalities.* George Tech ISyE Colloquium, Atlanta.

105. Richard, J.-P. P., Nguyen, T., & Tawarmalani, M. (2014). *On the convex hull of some nonlinear sets.* 18th Combinatorial Optimization Workshop, Aussois.

106. Wu, J., Kannan, K., & Tawarmalani, M. (2013). *Cardinality bundles for spence-mirrlees reservation prices.* INFORMS Annual Meeting, Minnesota.

107. Kim, J., Tawarmalani, M., & Richard, J.-P. P. (2013). *Cardinality constrained linear program: Facial disjunctive formulation and valid inequalitis.* INFORMS Annual Meeting, Minnesota.

108. Tawarmalani, M., Nguyen, T., & Richard, J.-P. P. (2013). *Convexification techniques for complementarity constraints.* INFORMS Annual Meeting, Minnesota.

109. Tawarmalani, M., & Richard, J.-P. P. (2013). *Convexification techniques for separable polynomial inequalities.* INFORMS Annual Meeting, Minnesota.

110. Richard, J.-P. P., & Tawarmalani, M. (2013). *On the convex hull of some nonlinear sets.* INFORMS Annual Meeting, Minnesota.

111. Davarnia, D., Richard, J.-P. P., & Tawarmalani, M. (2013). *Polyhedral results for network interdiction problem.* INFORMS Annual Meeting, Minnesota.

112. Nguyen, T. T., Richard, J.-P., & Tawarmalani, M. (2012). *Disjunctive cutting planes for linear complementarity constraints.* INFORMS Annual Meeting, Phoenix.

113. Khajavirad, A., Bao, X., Sahinidis, N. V., & Tawarmalani, M. (2012). *Global optimization of nonconvex problems with multilinear intermediates.* INFORMS Annual Meeting, Phoenix.

114. Tawarmalani, M., & Richard, J.-P. P. (2012). *Strong cuts for polynomial inequalities via disjunctive arguments.* INFORMS Annual Meeting, Phoenix.

115. Nguyen, T. T., Tawarmalani, M., & Richard, J.-P. P. (2011). *Convexification techniques for linear complementarity constraints.* INFORMS Annual Meeting, Charlotte.

116. Nguyen, T. T., Richard, J.-P. P., & Tawarmalani, M. (2011). *Cutting planes for linear complementarity constraints.* INFORMS Annual Meeting, Charlotte.

117. Richard, J.-P. P., Chung, K., & Tawarmalani, M. (2011). *On relations between 0-1 mixed integer bilinear covering sets and fixed-charge flow sets.* INFORMS Annual Meeting, Charlotte.

118. Tawarmalani, M., & Richard, J.-P. P. (2011). *Strong inequalities for polynomial covering sets via orthogonal disjunctions.* INFORMS Annual Meeting, Charlotte.

119. Nguyen, T. T., Tawarmalani, M., & Richard, J.-P. P. (2011). *Convexification techniques for linear complementarity constraints.* 15th conference on Integer Programming and Combinatorial Optimization, Armonk.

120. Tawarmalani, M., Nguyen, T. T., & Richard, J.-P. P. (2010). *On convex relaxations for orthogonal disjunctions and complementarity constraints.* Exploratory Workshop of Mixed-Integer Nonlinear Programming, Seville, Spain.

121. Nallasivam, U., Shah, V. H., Shenvi, A. A., Agrawal, R., & Tawarmalani, M. (2010). *Global optimization of multicomponent distillation configurations.* AIChE Annual Meeting, Salt Lake City.

122. Tawarmalani, M., Richard, J.-P. P., & Xiong, C. (2010). *Explicit envelopes through polyhedral subdivisions.* INFORMS Annual Meeting, Austin.

123. Tawarmalani, M. (2010). *Simultaneous convexification of nonlinear functions and sets.* INFORMS Annual Meeting, Austin.

124. Nguyen, T. T., Richard, J.-P. P., & Tawarmalani, M. (2010). *Global optimization results for linear complementarity problems.* INFORMS Annual Meeting, Austin.

125. Hajjat, M., Sun, X., Sung, Y. W., Maltz, D., Rao, S. G., Sripanidkulchai, K., & Tawarmalani, M. (2010). *Cloudward bound: Planning for beneficial migration of enterprise applications to the cloud.* ACM Sigcomm, New Delhi, India.

126. Richard, J.-P. P., Tawarmalani, M., & Xiong, C. (2010). *Explicit convex and concave envelopes via polyhedral subdivisions.* MIP, Atlanta.

127. Tawarmalani, M. (2010). *Polyhedrality and inclusion certificates in convexification.* European Workshop of Mixed-Integer Nonlinear Programming, Marseille, France.

128. Tawarmalani, M., Sahinidis, N. V., & Bao, X. (2009). *Exploiting multilinearity in global optimization relaxations.* INFORMS Annual Meeting, San Diego.

129. Xiong, C., Tawarmalani, M., & Richard, J.-P. P. (2009). *Convexification of nonconvex functions and polyhedral envelopes.* INFORMS Annual Meeting, San Diego.

130. Sahinidis, N. V., & Tawarmalani, M. (2009). *Global optimization of MINLPs with BARON.* INFORMS Annual Meeting, San Diego.

131. Chung, K., Richard, J.-P. P., & Tawarmalani, M. (2009). *Strong valid inequalities for an MPCC via orthogonal disjunctions.* INFORMS Annual Meeting, San Diego.

132. Bao, X., Sahinidis, N. V., & Tawarmalani, M. (2008). *Polyhedral relaxations for nonconvex quad-ratically-constrained quadratic programs.* AIChE Annual Meeting, Philadelphia.

133. Xia, Q., Ersoy, O., Tawarmalani, M., & Moskowitz, H. (2008). *Interactive clustering and classification.* Artificial Neural Networks in Engineering (ANNIE), St. Louis.

134. Sahinidis, N. V., & Tawarmalani, M. (2008). *Computational solution of MINLPs with BARON.* INFORMS Annual Meeting, Washington DC.

135. Sahinidis, N. V., & Tawarmalani, M. (2008). *A unifying framework for domain reduction.* INFORMS Annual Meeting, Washington DC.

136. Tawarmalani, M., & Richard, J.-P. P. (2008). *Strong inequalities for disjunctive sets via lifting.* INFORMS Annual Meeting, Washington DC.

137. Tawarmalani, M., Chung, K., & Richard, J.-P. P. (2008). *Strong inequalities for orthogonal disjunctions and polynomial covering sets.* INFORMS Annual Meeting, Washington DC.

138. Tawarmalani, M., Chung, K., & Richard, J.-P. P. (2008). *Strong inequalities for bilinear knapsack sets.* INFORMS Optimization Society Conference, Atlanta.

139. Tawarmalani, M., & Richard, J.-P. P. (2008). *Lifting inequalities: Generating strong cuts for nonlinear programs.* INFORMS Optimization Society Conference, Atlanta.

140. Chung, K., Tawarmalani, M., & Richard, J.-P. P. (2007). *Strong valid inequalities for bilinear integer knapsack sets.* INFORMS Annual Meeting, Seattle.

141. Tawarmalani, M., & Richard, J.-P. P. (2007). *Extending mixed-integer programming lifting techniques to nonlinear programming.*

142. Tawarmalani, M., & Richard, J.-P. P. (2007). *Generating strong cuts for nonlinear programs by lifting inequalities.* MIP, Montreal.

143. Rahman, M. S., Kannan, K., & Tawarmalani, M. (2007). *The countervailing incentive of restricted patch distribution: Economic and policy implications.* Workshop on the Economics of Information Security, Pittsburgh.

144. Tawarmalani, M. (2006). *Convex extensions, inclusion certificates and disjunctive programming.* INFORMS Annual Meeting, Pittsburgh.

145. Tawarmalani, M., & Richard, J.-P. P. (2006). *MIP lifting techniques for nonlinear programs.* INFORMS Annual Meeting, Pittsburgh.

146. Tawarmalani, M., Kannan, K., & De, P. (2006). *Allocating objects in a network of caches: Centralized and decentralized analyses.* INFORMS Annual Meeting, Pittsburgh.

147. Tawarmalani, M. (2006). *Convex extensions, inclusion certificates and disjunctive programming.* 19th Mathematical Programming Symposium, Rio De Janerio.

148. Richard, J.-P., & Tawarmalani, M. (2006). *MIP lifting techniques for mixed-integer nonlinear programs.* MIP, Coral Gables.

149. Tawarmalani, M. (2006). *Inclusion certificates and disjunctive programming.* Pittsburgh; Carnegie Mellon University, Pittsburgh.

150. Tawarmalani, M., Kannan, K., & De, P. (2005). *A mechanism for allocating objects in a network of symmetric caches.* Fifteenth Workshop on Information Technologies and Systems, Las Vegas.

151. Tawarmalani, M. (2005). *Convex extensions and convexification of nonlinear sets.* INFORMS Annual Meeting, San Francisco.

152. Richard, J.-P., & Tawarmalani, M. (2005). *MIP lifting techniques for mixed-integer nonlinear programs.* INFORMS Annual Meeting, San Francisco.

153. Wei, J., Duran, M., Furman, K., Sahinidis, N. V., & Tawarmalani, M. (2005). *Global optimization of stochastic nonconvex mixed integer nonlinear programming (MINLP) problems.* INFORMS Annual Meeting, San Francisco.

154. Tawarmalani, M., & Li, Y. (2005). *Minimizing flow disruption due to network maintenance.* INFORMS Annual Meeting, San Francisco.

155. Sahinidis, N. V., & Tawarmalani, M. (2005). *Global optimization with branch-and-reduce.* INFORMS Annual Meeting, San Francisco.

156. Tawarmalani, M., De, K. K. P., & Kumar, C. (2005). *Allocating objects in a network of caches: Social welfare and incentive compatibility.* First CDGO International Conference, Blacksburg.

157. Tawarmalani, M., & Sahinidis, N. V. (2005). *Solving nonlinear global optimization problems using BARON*. INFORMS ICS 9th Conference, Annapolis.

158. Tawarmalani, M. (2004). *Convexification and global optimization of nonlinear programs.* Workshop on Integer Programming and Continuous Optimization, Chemnitz, Germany.

159. Sahinidis, N. V., & Tawarmalani, M. (2004). *Strengthening polyhedral relaxations for global optimization problems.* AIChE Annual Meeting, Austin.

160. Sahinidis, N. V., & Tawarmalani, M. (2004). *A polyhedral branch-and-cut algorithm for global optimization.* INFORMS Annual Meeting, Denver.

161. Tawarmalani, M. (2003). *Convex extensions and convexification of nonlinear functions.* INFORMS Annual Meeting, Atlanta.

162. Tawarmalani, M., & Sahinidis, N. V. (2003). *A two-step procedure for convexification of lower semicontinuous functions.* INFORMS Annual Meeting, Atlanta.

163. Sahinidis, N. V., & Tawarmalani, M. (2003). *Global optimization with GAMS/BARON.* Atlanta.

164. Tawarmalani, M. (2003). *Convex extensions and polyhedral basis.* 18th International Symposium of Mathematical Programming, Denmark.

165. Sahinidis, N. V., & Tawarmalani, M. (2002). *Global optimization with BARON.* INFORMS Annual Meeting, San Jose.

166. Tawarmalani, M. (2002). *Convex extensions and polyhedral basis.* INFORMS Annual Meeting, San Jose.

167. Tawarmalani, M., & Sahinidis, N. V. (2002). *Finiteness and convexification issues in mixed-integer nonlinear programming.* Integer Programming Conference in Honor of Egon Balas, Pittsburgh, PA.

168. Tawarmalani, M., & Sahinidis, N. V. (2001). *Global optimization of mixed integer nonlinear programs.* AICHE Annual Meeting.

169. Sahinidis, N. V., Tawarmalani, M., Yu, M., & Nanda, G. (2001). *A novel MINLP approach to molecular design.* AICHE Annual Meeting, Reno.

170. Tawarmalani, M., & Sahinidis, N. V. (2001). *Convex envelopes of nonlinear functions.* INFORMS Annual Meeting, Miami.

171. Sahinidis, N. V., & Tawarmalani, M. (2001). *Global optimization of mixed integer nonlinear programs.* INFORMS Annual Meeting, Miami.

172. Tawarmalani, M., & Sahinidis, N. V. (2001). *Domain reduction in global optimization and mixed integer nonlinear programs.* INFORMS Annual Meeting, Miami.

173. Tawarmalani, M., & Sahinidis, N. V. (2000). *Global optimization of mixed integer nonlinear programs.* 17th International Symposium of Mathematical Programming, Atlanta.

174. Tawarmalani, M., & Sahinidis, N. V. (2000). *Semidefinite relaxations of fractional programs via novel techniques for constructing convex envelopes of nonlinear functions.* 17th International Symposium of Mathematical Programming, Atlanta.

175. Ahmed, S., Tawarmalani, M., & Sahinidis, N. V. (2000). *Global optimization of two-stage stochastic integer programs.* 17th International Symposium of Mathematical Programming, Atlanta.

176. Sahinidis, N. V., & Tawarmalani, M. (2000). *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.

177. Sahindis, N. V., Ahmed, S., & Tawarmalani, M. (2000). *Global optimization for stochastic integer programming.*

178. Tawarmalani, M., & Sahinidis, N. V. (2000). *Convexification using convex extensions and semidefinite relaxations of fractional programs.* INFORMS Annual Meeting, Salt Lake City, Utah.

179. Ahmed, S., Tawarmalani, M., & Sahinidis, N. V. (2000). *A finite branch and bound algorithm for two-stage stochastic integer programs.* INFORMS Annual Meeting, Salt Lake City, Utah.

180. Tawarmalani, M., Ahmed, S., & Sahinidis, N. V. (1999). *Convexification tools in integer programming.* INFORMS Annual Meeting, Philadelphia, PA.

181. Ahmed, S., Tawarmalani, M., & Sahinidis, N. V. (1999). *Global optimization of two-stage stochastic mixed-integer programs.* INFORMS Annual Meeting, Philadelphia, PA.

182. Sahinidis, N. V., Tawarmalani, M., & Yu, M. (1999). *Novel molecular designs via global optimization.* AICHE Annual Meeting, Dallas, TX.

183. Ahmed, S., Tawarmalani, M., & Sahinidis, N. V. (1999). *A finite branch and bound scheme for two-stage stochastic integer programs.* INFORMS Annual Meeting, Cincinnati, OH.

184. Sahinidis, N. V., Tawarmalani, M., & Ahmed, S. (1998). *New results in 0-1 optimization.* AICHE Annual Meeting, Miami Beach, FL.

185. Tawarmalani, M., Ahmed, S., & Sahinidis, N. V. (1998). *Convexification of 0-1 fractional programs.* INFORMS Annual Meeting, Seattle, WA.

186. Tawarmalani, M., Adhya, N., & Sahinidis, N. V. (1998). *Global optimization of the pooling problem.* INFORMS Annual Meeting, Seattle, WA.

187. Tawarmalani, M., Adhya, N., & Sahinidis, N. V. (1998). *Global optimization of the pooling problem.* 2nd Engineering Design Automation Conference, Maui, HI.

188. Tawarmalani, M., & Sahinidis, N. V. (1996). *Decomposition method for the TDTSP and QAP.* INFORMS Annual Meeting, Washington, DC.

Software

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

Honors

- Led Krenicki center as a 2025 Mira award finalist for higher education innovation
- 2024 Computing in Chemical Engineering Award (with R. Agrawal), CAST Division, AIChE
- Big Academic Alliance Academic Leadership Program Fellow, 2024-2025
- Led Purdue's team to win 2023 INFORMS UPS George D. Smith Prize
- Salgo-Noren Outstanding Master's Teacher, 2022, 2023
- Distinguished Residential Master's Program Teacher, Spring 2021
- Distinguished Elective MBA Teaching Recognition, 2014–2023

- 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
- 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

Patents

- Distillation Heating System and Method, Provisional Application, PRF 70601-01, 63/555,569, (2024)

Graduated PhD Students

1. Jongeun Kim (2022)
2. Hyun-Ju Oh (2022)
3. Ashish Chandra (2022)
4. Tony Joseph Mathew (2021)
5. Taotao He (2019)
6. Radhakrishna Tumbalam Gooty (2020)
7. Zheyu Jiang (2018)
8. Trang Nguyen (2016)
9. Jinhak Kim (2016)
10. Danial Davarnia (2016)
11. Fisher Wu (2014)
12. Chuanhui Xiong (2011)
13. Kwanghun Chung (2010)

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
- 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, 2020-2023

- Member, Transition Steering Committee, 2022-till date
- Chair, Design Committee for PhD in Business Analytics & Data Science, 2022
- Director, Krenicki Center for Business Analytics & Machine Learning, 2022-till date
- PhD Advisor for Quantitative Methods, 2007-till date
- Member, Organizing team member for AT Kearney sponsored Industry Practicum, Fall 2022
- Member, Faculty group visit for MOU signing with IIT Chennai and Delhi, 2022
- Member, Clinical faculty search committee, 2022-2023
- Member, Krannert Data Initiative Committee, 2022-2023
- Co-chair Application for INFORMS UPS Prize, 2022-2023
- Member, Application for INFORMS UPS Prize, 2021-2022
- Department Restructuring Committee, 2022
- Member, Tech MBA Design Committee, 2022
- Member, MBA Design Committee, 2021
- Co-Chair, Design Committee for Bachelors in Business Analytics and Information Management, 2020-2021
- 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, 2015-2020
- 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
- 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, *SIAM Journal on Optimization*, Associate Editor, *Operations Research Forum*
- Cluster Co-Chair, ICCOPT, Convexification and Global Optimization, 2022
- Nicholson Award Committee, 2021, 2022
- 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.