SIQIAN SHEN
Professor
Department of Industrial and Operations Engineering
University of Michigan, Ann Arbor
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EDUCATION

- PhD, August 2011, Industrial and Systems Engineering, University of Florida
    - *Thesis*: "Reformulation and Cutting-Plane Approaches for Solving Two-Stage Optimization and Network Interdiction Problems."
    - *Advisor*: Professor J. Cole Smith
- M.S., August 2009, Industrial and Systems Engineering, University of Florida
- B.S., July 2007, Industrial Engineering, Tsinghua University, China

EMPLOYMENT

- Program Director, National Science Foundation, Division of CMMI, Civil Infrastructure Systems (CIS) Program, 2023-present
- Professor of Industrial and Operations Engineering and Civil and Environmental Engineering (courtesy appointment), University of Michigan at Ann Arbor, 2023-present
- Associate Professor of Industrial and Operations Engineering, University of Michigan at Ann Arbor, 2017-2023
- Associate Professor of Civil and Environmental Engineering (courtesy appointment), University of Michigan at Ann Arbor, 2018-2023
- Assistant Professor of Industrial and Operations Engineering, University of Michigan at Ann Arbor, 2011-2017
- Associate Director of Michigan Institute for Computational Discovery & Engineering (MICDE), University of Michigan at Ann Arbor, 2016-present

RESEARCH AREAS

- Theories: Stochastic and robust optimization; network optimization; computational methods for nonconvex optimization models with integer variables and nonlinear constraints.
- Applications: (i) Optimal power flow, power transmission planning; (ii) shared-mobility system design and operations management; (iii) supply chain and logistics; (iv) cloud computing/quantum computing; (v) healthcare scheduling and resource allocation for emergency response.

HONORS AND AWARDS

- IOE Richard Wilson Faculty Scholar, University of Michigan, 2021-2024
- Best Conference Paper Award Finalist, 2023 IEEE 19th International Conference on Automation Science and Engineering (CASE).
- Best Conference and Application Paper Award Finalist, 2022 IEEE 18th International Conference on Automation Science and Engineering (CASE).
- Best Track Modeling & Simulation Paper of the 2022 IISE Annual Conference & Expo, 2022.

- IOE Department Faculty Award, University of Michigan, 2021.
- Best Paper Honorable Mention in the 2020 IISE Transactions Focus Issue on Operations Engineering and Analytics.
- Faculty Advisor for the honorable mention of the INFORMS Optimization Society Student Paper Prize, 2019.
- Department of Energy (DoE) Early Career Award, 2017
- Faculty Advisor for the Undergraduate Operations Research Award, Institute for Operations Research and the Management Sciences (INFORMS), 2016
- Best Paper Award Honorable Mention, Institute for Operations Research and the Management Sciences (INFORMS) Section on Public Programs, Services and Needs, 2014.
- Early Career Travel Award to the Society for Industrial and Applied Mathematics (SIAM) Conference on Optimization (OP14)
- Best Paper Award Finalist, Institute for Operations Research and the Management Sciences (INFORMS) Service Science Section, 2013
- Young Researcher Travel Scholarship, the 13th International Conference on Stochastic Programming (ICSP), 2013
- IBM Smarter Planet Innovation Faculty Award, 2012

Awards received as a PhD student (2007-2011):

- Pritsker Doctoral Dissertation Award, 1st Place, Institute of Industrial Engineers (IIE), 2012
- Graduate Award for Excellence in Research, Department of Industrial and Systems Engineering, University of Florida, 2011
- Runner-Up of the INFORMS Computing Society Student Paper Award, 2010
- Chinese Government Award for Outstanding Self-Financed Students Abroad, 2010
- INFORMS Future Academician Colloquium Participant, 2010
- Mixed Integer Programming Workshop Student Travel Award, 2010
- Outstanding Academic Achievements Award, University of Florida, 2008-2010
- University of Florida Graduate Alumni Fellowship, 2007-2011

REFEREED JOURNAL PAPERS
(Authors underline are graduate students; authors underlined and marked with * are undergraduate students.)

1. Kati Moug, **Siqian Shen**, "The Costs of Overcrowding (and Release): Strategic Discharges for Isolated Facilities During Epidemiological Outbreaks," to appear in *Computers and Operations Research*, 2024. Available at SSRN: https://ssrn.com/abstract=4340528 or http://dx.doi.org/10.2139/ssrn.4340528

2. Bo Zhou, Ruiwei Jiang, **Siqian Shen**, "Frequency Stability-Constrained Unit Commitment: Tight Approximation using Bernstein Polynomials," to appear in *IEEE Transactions on Power Systems*, 2023. https://arxiv.org/abs/2212.12088

3. Mingjie Bi, Dawn Tilbury, **Siqian Shen**, Kira Barton, "A Distributed Approach for Agile Supply Chain Decision Making Based on Network Attributes," to appear in *IEEE Transactions on Automation Science and Engineering*, 2023.

4. Huiwen Jia, Cong Shi, **Siqian Shen**, "Online learning and pricing for service systems with reusable resource," to appear in *Operations Research*, 2023.
    https://doi.org/10.1287/opre.2022.2381

5. Mingyao Qi, Ruiwei Jiang, **Siqian Shen**, "Sequential competitive facility location: Exact and approximate algorithms," *Operations Research*, 72(1), 300-316, 2024.
    https://doi.org/10.1287/opre.2022.2339

6. Xinyu Fei, Xingmin Wang, Xian Yu, Yiheng Feng, Henry Liu, **Siqian Shen**, Yafeng Yin, "Traffic signal control under stochastic traffic demand and vehicle turning via decentralized decomposition approaches", *European Journal of Operational Research*, 310(2): 712-736, 2023.
    https://doi.org/10.1016/j.ejor.2023.04.012

7. Kati Moug, Huiwen Jia, **Siqian Shen**, "A shared mobility based framework for evacuation planning and operations under forecast uncertainty," *IISE Transactions,* 55(10), 971-984, 2023.
    https://doi.org/10.1080/24725854.2022.2140367

8. Xinyu Fei, Lucas T. Brady, Jeffrey Larson, Sven Leyffer, **Siqian Shen**, "Binary control pulse optimization for quantum systems," *Quantum*, vol. 7, page 892, 2023.
    https://doi.org/10.22331/q-2023-01-04-892

9. Xian Yu, **Siqian Shen**, Babak Badri-Koohi, Haitham Seada, "Time window optimization for attended home service delivery under multiple sources of uncertainties," *Computers & Operations Research*, vol. 150, 2023.

10. Beste Basciftci, Xian Yu, **Siqian Shen**, "Resource distribution under spatiotemporal uncertainty of disease spread: Stochastic versus robust approaches," *Computers and Operations Research*, vol. 149, 2023.

11. Gongyu Chen*, Xinyu Fei, Huiwen Jia, Xian Yu, **Siqian Shen**, "The University of Michigan implements a hub-and-spoke design to accommodate social distancing in the campus bus system under COVID restrictions", *INFORMS Journal on Applied Analytics*, 52(6):539-552, 2023.
    https://doi.org/10.1287/inte.2022.1131

12. Huiwen Jia, **Siqian Shen**, Jorge Alberto Ramírez García*, Cong Shi, "Partner with a Third-Party Delivery Service or Not? -- A Prediction-and-Decision Tool for Restaurants Facing Takeout Demand Surges During a Pandemic", *Service Science*, 14(2), 139-155, 2022.
    https://doi.org/10.1287/serv.2021.0294

13. Miao Yu, Viswanath Nagarajan, **Siqian Shen**, "Improving Column-Generation and Column-Enumeration for Vehicle Routing Problems via Random Coloring and Parallelization," *INFORMS Journal on Computing*, 13(3), 172-191, 2022. https://doi.org/10.1287/ijoc.2021.1105
    a. Featured article in the Spring 2022 issue of Volume 34 of the journal.

14. Huiwen Jia, Cong Shi, **Siqian Shen**, "Multi-armed bandit with sub-exponential reward," *Operations Research Letters*, 48(5), 728-733, 2021. https://doi.org/10.1016/j.orl.2021.08.004

15. <u>Xian Yu</u>, **Siqian Shen**, Huizhu Wang, "Integrated Vehicle Routing and Service Scheduling under Time and Cancellation Uncertainties with Application in Non-Emergency Medical Transportation," *Service Science*, 13(3), 172-191, 2021. https://doi.org/10.1287/serv.2021.0277

16. <u>Hideaki Nakao,</u> Ruiwei Jiang, **Siqian Shen**, "Distributionally robust Partially Observable Markov Decision Process with moment-based ambiguity", *SIAM Journal on Optimization*, 31(1), 461–488, 2021.

17. <u>Huiwen Jia</u>, **Siqian Shen**, "Benders cut classification for solving two-stage stochastic programs via Support Vector Machines," *INFORMS Journal on Optimization*, 3(3), 278-297, 2021. https://doi.org/10.1287/ijoo.2019.0050

18. <u>Beste Basciftci</u>, Shabbir Ahmed, **Siqian Shen**, "Distributionally robust facility location problem under decision-dependent stochastic demand," *European Journal of Operational Research*, 292(2), 548-561, 2021.

19. <u>Xian Yu</u>, **Siqian Shen**, "Multistage distributionally robust mixed-integer programming with decision-dependent moment-based ambiguity sets," *Mathematical Programming Series B,* vol. 196, 1025-1064, 2022. https://doi.org/10.1007/s10107-020-01580-4

20. <u>Yan Deng</u>, <u>Huiwen Jia</u>, Shabbir Ahmed, Jon Lee, **Siqian Shen**, "Scenario grouping and decomposition algorithms for chance-constrained programs", *INFORMS Journal on Computing*, 33 (2) 757-773, 2021. https://doi.org/10.1287/ijoc.2020.0970

21. Mengshi Lu, <u>Hideaki Nakao,</u> **Siqian Shen**, Lin Zhao, "Nonprofit resource allocation with cross-subsidization under uncertain resource consumption," *OMEGA (International Journal of Management Science)*, volume 99, March 2021, 102191. https://doi.org/10.1016/j.omega.2019.102191

22. <u>Yiling Zhang</u>, Mengshi Lu, **Siqian Shen**, "On the values of vehicle-to-grid selling in electric vehicle sharing," *Manufacturing and Service Operations Management*, 23(2), 488–507, 2021. https://doi.org/10.1287/msom.2019.0855

23. <u>Xian Yu</u>, **Siqian Shen**, "An integrated decomposition and Approximate Dynamic Programming approach for on-demand ride pooling," *IEEE Transactions on Intelligent Transportation Systems,* 21(9), 3811-3820, 2020.

24. Xuan Vinh Doan, <u>Xiao Lei*</u>, **Siqian Shen,** "Pricing of reusable resources under ambiguous distributions of demand and service," *European Journal of Operational Research*, 282(1), 235-251, 2020.

25. <u>Miao Yu</u>, **Siqian Shen**, "An integrated car-and-ride sharing system for mobilizing heterogeneous travelers with application in underserved communities," *IISE Transactions*, 52(2), 151-165, 2020.

    - Featured article in the January 2020 issue of the Institute of Industrial and Systems Engineer's *Industrial and Systems Engineer* magazine.
    - Honorable Mention, Best Paper in the *2020 IISE Transactions Focus Issue on Operations Engineering and Analytics* (among all papers published from July 1, 2019 through June 30, 2020, issues 51:7 through 52:6).

26. <u>Yuchen Jiang</u>, Cong Shi, **Siqian Shen**, "Service-level constrained inventory systems: Structures and Approximation Algorithms," *Production and Operations Management,* 28(9), 2365-2389, 2019.

27. <u>Yan Deng</u>, **Siqian Shen**, Brian Denton, "Chance-constrained surgery planning under conditions of limited and ambiguous data," *INFORMS Journal on Computing*, 31(3), 559-575, 2019. **(Best Paper**

Honorable Mention of the 2014 INFORMS Section on Public Programs, Services and Needs).

28. <u>Miao Yu</u>, Viswanath Nagarajan, **Siqian Shen**, "An approximation algorithm for vehicle routing with compatibility constraints," *Operations Research Letters,* 46(6), 579-584, 2018.

29. <u>Yiling Zhang</u>, Ruiwei Jiang, **Siqian Shen**, "Ambiguous chance-constrained binary programs under mean-covariance information", *SIAM Journal on Optimization*, 28(4), 2922-2944, 2018.
(Honorable mention by the 2019 INFORMS Optimization Society Best Student Paper Award.)

30. <u>Yiling Zhang</u>, **Siqian Shen**, Sadeet A. Erdogan, "Solving 0-1 semidefinite programs for distributionally robust allocation of surgery blocks," *Optimization Letters,* 12(7), 1503–1521, 2018, https://doi.org /10.1007/s11590-018-1255-9

31. Mengshi Lu, <u>Zhihao Chen</u>, **Siqian Shen**, "Optimizing the profitability and quality of service in carshare systems under demand uncertainty," *Manufacturing and Service Operations Management,* 20(2), 162-180, 2018. **(Selected Lead Article of the Spring Issue of 2018)**

32. <u>Yan Deng</u>, Shabbir Ahmed, **Siqian Shen**, "Parallel scenario decomposition of risk averse 0-1 stochastic programs", *INFORMS Journal on Computing*, 30(1), 90-105, 2018.

33. <u>Xiao Lei</u>*, **Siqian Shen**, Yongjia Song, "Stochastic maximum flow interdiction problems under heterogeneous risk references", *Computers & Operations Research*, 90(1), 97-109, 2018.

34. Ruiwei Jiang, **Siqian Shen**, <u>Yiling Zhang</u>, "Integer programming approaches for appointment scheduling with random no-shows and service durations," *Operations Research,* 65(6), 1638 − 1656, 2017.

35. <u>Hideaki Nakao,</u> **Siqian Shen**, <u>Zhihao Chen</u>, "Network design in scarce data environments using moment-based distributionally robust optimization", *Computers & Operations Research*, 88(1), 44-57, 2017

36. **Siqian Shen**, <u>Mingdi You, Yintai Ma</u>*, "Single-commodity stochastic network design under demand and topological uncertainties with insufficient data," *Naval Research Logistics,* 64(2), 154-173, 2017.

37. <u>Joy Chang</u>*, <u>Miao Yu</u>, **Siqian Shen**, Ming Xu, "Location design and relocation of a mixed carsharing fleet with CO_2 emission constraint," *Service Science,* 9(3), 205-218, 2017. **(Winner of the INFORMS Undergraduate Operations Research Prize, 1st place)**.

38. <u>Yiling Zhang</u>, **Siqian Shen**, Sadeet A. Erdogan, "Distributionally robust appointment scheduling with moment-based ambiguity set," *Operations Research Letters*, 45(2), 139-144, 2017.

39. <u>Yiling Zhang</u>, **Siqian Shen,** Johanna Mathieu, "Distributionally robust chance-constrained optimal power flow with uncertain renewables and uncertain reserves provided by loads," *IEEE Transactions on Power Systems*, 32(2), 1378-1388, 2017.

40. <u>Yuchen Jiang, Juan Xu</u>*, **Siqian Shen,** Cong Shi, "Production planning problem with joint service-level guarantee: A computational study," *International Journal of Production Research,* 55(1), 38-58, 2017.

41. <u>Yan Deng</u>, **Siqian Shen,** "Decomposition algorithms for optimizing multi-server appointment scheduling with chance constraints," *Mathematical Programming,* 157(1), 245-276, 2016.

42. Miguel Lejeune, **Siqian Shen,** "Multi-objective probabilistically constrained programs with variable risk: Models for multi-portfolio financial optimization," *European Journal of Operational Research*, 252(2), 522–539, 2016.

43. <u>Kayse Maass</u>, Mark Daskin, **Siqian Shen**, "Mitigating hard capacity constraints with inventory in facility location modeling," *IIE Transactions*, 48(2), 120-133, 2016.
44. Yongjia Song, **Siqian Shen**, "Risk averse shortest path interdiction," *INFORMS Journal on Computing*, 28(3), 527-539, 2016.
45. **Siqian Shen**, Murat Kurt, <u>Jue Wang</u>, "Chance-constrained programming models and approximation algorithms for general stochastic bottleneck spanning tree problems," *INFORMS Journal on Computing*, 27(2): 301–316, 2015.
46. Qipeng Zheng, **Siqian Shen**, <u>Yuhui Shi</u> "Loss-constrained minimum cost flow under arc failure uncertainty with applications to risk-aware kidney exchange," *IIE Transactions,* 47(9): 961-977, 2015.
47. **Siqian Shen**, "Using integer programming for balancing return and risk in problems with individual chance constraints," *Computers & Operations Research*, 49(1): 59–70, 2014.
48. **Siqian Shen**, <u>Jue Wang</u>, "Stochastic modeling and approaches for managing energy footprints in Cloud Computing service," *Service Science*, 6(1): 15–33, 2014. **(Best Paper Award Finalist of the 2013 INFORMS Service Science Section)**
49. **Siqian Shen**, <u>Zhihao Chen</u>, "Optimization models for differentiating quality of service levels in probabilistic network capacity design problems," *Transportation Research Part B, Methodological*, 58(1): 71–91, 2013.
50. <u>Yan Deng</u>, **Siqian Shen**, Yevgeniy Vorobeychik, "Optimization methods for disease prevention and epidemic control," *Mathematical Biosciences*, 246(1), 213–227, 2013.
51. **Siqian Shen,** J. Cole Smith, "A decomposition approach for solving a broadcast domination network design problem," *Annals of Operations Research*, 210(1), 333–360, 2013.
52. **Siqian Shen**, "Optimizing designs and operations of a single network or multiple interdependent infrastructures under stochastic arc disruptions," *Computers & Operations Research*, 40(11): 2677–2688, 2013.
53. John Penuel, J. Cole Smith, **Siqian Shen**, "Integer programming models and algorithms for the graph decontamination problem with mobile agents," *Networks*, 61(1): 1–19, 2013.
54. **Siqian Shen**, J. Cole Smith, "Polynomial-time algorithms for disconnecting trees and series-parallel graphs under component connectivity metrics," *Networks*, 60(2): 103–119, 2012.
55. **Siqian Shen**, J. Cole Smith, <u>Roshan Goli*,</u> "Exact interdiction models and algorithms for disconnecting networks via node deletions," *Discrete Optimization*, 9(3): 172–188, 2012.
56. **Siqian Shen**, J. Cole Smith, Shabbir Ahmed, "Expectation and chance-constrained models and algorithms for insuring critical paths," *Management Science*, 56(10): 1794–1894, 2010. **(Runner-up of the 2011 INFORMS Computing Society Best Student Paper Award)**

REFEREED CONFERENCE PROCEEDINGS

1. Bo Zhou, Ruiwei Jiang, **Siqian Shen**, "Learning to Solve Bilevel Programs with Binary Tender," accepted to the *International Conference on Learning Representations (ICLR 2024)*, Vienna, Austria, May 2024.
2. <u>Juan-Alberto Estrada-Garcia</u>, <u>Mingjie Bi</u>, Dawn Tilbury, Kira Barton, **Siqian Shen**, "A multi-objective mixed-integer programming approach for supply chain disruption response with lead-time awareness," in the Proceedings of *2023 IEEE 19th International Conference on Automation Science and Engineering (CASE 2023)*, Auckland, New Zealand, 2023. **(IEEE CASE 2023 Best Conference Paper award Finalist)**

3. Bo Zhou, Ruiwei Jiang, **Siqian Shen**, "Differential-Algebraic Equation-Constrained Frequency-Secured Stochastic Unit Commitment," in the Proceedings of 2023 IEEE Power & Energy Society General Meeting (PESGM), Orlando, FL, July 2023.

4. <u>Huiwen Jia</u>, Cong Shi, **Siqian Shen, "**Online Learning and Pricing for Network Revenue Management with Reusable Resources," in the Proceedings of the Thirty-Sixth Conference on Neural Information Processing Systems (*NeurIPS 2022*), New Orleans, Louisiana, December 2022.

5. Xian Yu, **Siqian Shen**, "Risk-averse reinforcement learning via dynamic time-consistent risk measures", in the Proceedings of *the 61ˢᵗ IEEE Conference on Decision and Control (CDC 2022)*, Cancun, Mexico, December 2022.

6. Mingjie Bi, Gongyu Chen, Dawn Tilbury, **Siqian Shen**, Kira Barton, "A Model-based Multi-agent Framework to Enable an Agile Response to Supply Chain Disruptions," in the Proceedings of *2022 IEEE 18th International Conference on Automation Science and Engineering (CASE) (CASE 2022)*, Mexico City, Mexico, 2022. (**Best Conference and Application Paper award Finalist at CASE 2022**) https://arxiv.org/abs/2207.03460

7. <u>Huiwen Jia</u>, Cong Shi, **Siqian Shen,** "Online Learning and Pricing with Reusable Resources: Linear Bandit with Sub-exponential Rewards", in the Proceedings of *International Conference on Machine Learning 2022 (ICML2022),* Baltimore, Maryland, USA, July 2022.

8. Juan Estrada-Garcia, **Siqian Shen**, Wen Ye, "Interactive dashboards to study relations between early COVID-19 outbreaks and human mobility trends", in the Proceedings of *the Institute of Industrial and Systems Engineering (IISE) Annual Conference & Expo 2022*, Seattle, WA, 2022.

9. Juan Estrada-Garcia, **Siqian Shen**, Wen Ye, "A simulation framework to evaluate efficiency and safety of public transportation systems during pandemic", in the Proceedings of *the Institute of Industrial and Systems Engineering (IISE) Annual Conference & Expo 2022*, Seattle, WA, 2022. (**Best Track Modeling & Simulation Paper of the 2022 IISE Annual Conference & Expo**)

10. Kati Moug, Mayur Padharia, Kevin Smith, **Siqian Shen**, Brian Denton, Amy Cohn, "Mid-semester Pandemic-driven Course Rescheduling with Integer Programming", in the Proceedings of *the Institute of Industrial and Systems Engineering (IISE) Annual Conference & Expo 2022*, Seattle, WA, May 2022.

11. <u>Huiwen Jia</u>, Jun Fang, Naiqiang Tan, Xinyue Liu, Zengwei Huo, Nan Ma, Guobin Wu, Hua Chai, Xiaohu Qie, Bo Zhang, Yafeng Yin, **Siqian Shen,** "Context-aware Route Recommendation with Weight Learning through Deep Neural Networks", in the Proceedings of *2020 American Control Conference (ACC)*, Denver, CO, 2020.

12. <u>Yiling Zhang</u>, Jin Dong, Teja Kuruganti, **Siqian Shen** and Yaosuo Xue, "Distributionally robust building load control to compensate fluctuations in solar power generation", in Proceedings of *2019 American Control Conference (ACC)*, Philadelphia, PA, 2019.

13. Kayse Maass*, Mark Daskin, **Siqian Shen**, "Utilizing Chance Constraints to Allow Short Term Processing Capacity Flexibility", in the Proceeding of International Symposium on Locational Decisions 2017 (ISOLDE 2017), July 2017.

14. <u>Joy Chang*</u>, <u>Fanny Pinto Delgado</u>, <u>Spencer Maroukis*</u>, <u>Abdi Zeynu</u>, Johanna Mathieu, **Siqian Shen**, "An interactive game introducing power flow optimization concepts", in the Proceedings of 2017 ASEE Annual Conference & Exposition, Columbus, Ohio, June 2017.

15. <u>Miao Yu</u>, Viswanath Nagarajan, **Siqian Shen**, "Minimum Makespan Vehicle Routing Problem with Compatibility Constraint," in the Proceedings of the 14ᵗʰ International Conference on Integration of

Artificial Intelligence and Operations Research Techniques in Constraint Programming (CPAIOR 2017), Padova, Italy, June 2017.

16. Yiling Zhang, Bowen Li, **Siqian Shen**, Johanna Mathieu, "Distributionally Robust Multi-Period Optimal Power Flow with Flexible Loads," in Proceedings of 2017 IEEE PES PowerTech Conference (PowerTech 2017), Manchester, UK, June 2017.

17. Andrew Orso, Jon Lee, **Siqian Shen**, "Submodular minimization in the context of modern LP and MILP methods and solvers." E. Bampis (Ed.): SEA 2015, *LNCS* 9125, pp. 193–204, 2015.

18. Yiling Zhang, **Siqian Shen**, Johanna Mathieu, "Data-driven Optimization Approaches for Optimal Power Flow with Uncertain Reserves from Load Control," in Proceedings of *2015 American Control Conference (ACC)*, Chicago, IL, 2015.

19. Jue Wang, **Siqian Shen**, "Risk and energy consumption tradeoffs in Cloud Computing service via stochastic optimization models," in Proceedings of the 5th IEEE/ACM International Conference on Utility and Cloud Computing (UCC2012), Chicago, IL, November, 2012.

BOOK CHAPTERS

1. **Siqian Shen**, "Domination problems," In *Encyclopedia of Operations Research and Management Science* (edited by J. J. Cochran), Wiley, Hoboken, NJ, 2011.

PUBLICATIONS IN POPULAR PRESS/MAGAZINES

1. **Siqian Shen**, "How much coronavirus testing is enough? States could learn from retailers as they ramp up?" The Conversation, April 21, 2020.

2. Sheldon H. Jacobson, Jerome F. Hajjar, Dawn Tilbury, Andrew Johnson, Erick Moreno-Centeno, **Siqian Shen**, "Future Directions for Broader Impacts at the National Science Foundation," OR/MS Today, 45(1), February 2018.

REFEREED CONFERENCE ABSTRACTS

1. **Siqian Shen**, "Optimization and Data Analytics Tools for Addressing COVID-19 Related Problems," 2021 Models of Infectious Disease Agent Study (MIDAS) Network Annual Meeting.

2. Kati Moug, Huiwen Jia, **Siqian Shen**, "A Shared-mobility-based Evacuation Planning and Operations Framework with Demand Uncertainty," Transportation Science and Logistics (TSL) Society Conference, 2020. (postponed)

3. Xian Yu, **Siqian Shen**, "Distributed Approaches for Traffic Signal Control Using Alternating Direction Method of Multipliers," Transportation Science and Logistics (TSL) Society Conference, 2020. (postponed)

4. Huiwen Jia, **Siqian Shen**, "Benders Cut Classification for Two-stage Stochastic Integer Programs via Support Vector Machines." 2019 Mixed-Integer Programming (MIP) Workshop, Cambridge, MA.

5. Xian Yu, **Siqian Shen**, "Multistage Distributionally Robust Mixed-integer Programming with Decision-Dependent Ambiguity Sets," 2019 Mixed-integer Programming (MIP) Workshop, Cambridge, MA.

6. Miao Yu, **Siqian Shen**, "Self-Sustained Car-and-Ride Sharing Design and Optimization for Improving the Mobility of Underserved Communities," INFORMS Transportation Science and

Logistics Society, the 1st Triennial Conference, "MOBILITY 2020: Traffic, Transportation and Logistics in a Cyber Connected World," Chicago, IL, July 2017.

7. Mengshi Lu, **Siqian Shen**, <u>Zhihao Chen</u>, "Optimizing the Profitability and Quality of Service in Carshare Systems under Demand Uncertainty," INFORMS Transportation Science and Logistics Society, the 1st Triennial Conference, "MOBILITY 2020: Traffic, Transportation and Logistics in a Cyber Connected World," Chicago, IL, July 2017.

8. Zhili Zhou, **Siqian Shen**, "Sensor Placement for Stochastic Traffic Congestion Observation," the 3rd INFORMS Transportation Science and Logistics Society Workshop, "Handling uncertainty in planning logistics and transportation systems," Chicago, IL, June 30-July 2, 2014.

9. <u>Zhihao Chen</u>, **Siqian Shen**, "Distributionally Robust Multi-Commodity Network Design Problems under Demand Ambiguity," the 3rd INFORMS Transportation Science and Logistics Society Workshop, "Handling uncertainty in planning logistics and transportation systems," Chicago, IL, June 30-July 2, 2014.

10. <u>Kayse Maass</u>, Mark Daskin, **Siqian Shen**, "A New Stochastic Capacitated Facility Location Modeling Approach," the 3rd INFORMS Transportation Science and Logistics Society Workshop, "Handling uncertainty in planning logistics and transportation systems," Chicago, IL, June 30-July 2, 2014.

11. <u>Kayse Maass</u>, Mark Daskin, **Siqian Shen**, "A New Stochastic Capacitated Facility Location Modeling Approach," the Industrial and Systems Engineering Research Conference (ISERC), Montreal, CA, 2014.

12. <u>Zhihao Chen</u>, **Siqian Shen**, Miguel Lejeune, "Robust Weight Optimization of Return and Reliability in Multi-Portfolio Optimization." The Industrial and Systems Engineering Research Conference (ISERC), Montreal, CA, 2014.

13. <u>Yan Deng</u>, **Siqian Shen**, Brian Denton, "Chance-constrained surgery planning under uncertain or ambiguous surgery duration." The Manufacturing & Service Operations Management (MSOM) Conference, Seattle, WA, 2014.

14. <u>Yan Deng</u>, **Siqian Shen**, Jon Lee, "Dual decomposition algorithms for solving chance-constrained binary programs." 2014 Mixed-Integer Programming (MIP) Workshop, Columbus, OH.

PhD THESIS SUPERVISION

1. Yan Deng, University of Michigan at Ann Arbor, PhD, May 2016
   - Thesis: "Decomposition Algorithms and Parallel Computing for Chance-Constrained and Stochastic Integer Programs with Applications."
   - First position: Google, Inc.

2. Zhihao Chen, University of Michigan at Ann Arbor, PhD, May 2016
   - Thesis: "Strategic Network Planning Under Uncertainty with Two-Stage Stochastic Integer Programming."
   - First position: Amazon, Inc.

3. Yuchen Jiang, University of Michigan at Ann Arbor, PhD, May 2018
   - Thesis: "Supply Chain and Revenue Management for Online Retailing."
   - Co-advisor: Prof. Cong Shi, University of Michigan
   - First position: Uber, Inc.

4. Yiling Zhang, University of Michigan at Ann Arbor, PhD, May 2019
   - Thesis: "Convex Nonlinear and Integer Programming Approaches for Distributionally Robust Optimization of Complex Systems."
   - Co-advisor: Prof. Ruiwei Jiang, University of Michigan
   - First position: Assistant Professor, Department of Industrial and Systems Engineering, University of Minnesota at Twin Cities.

5. Miao Yu, University of Michigan at Ann Arbor, PhD, May 2020
   - Thesis: "Optimization Approaches for Mobility and Service Sharing."
   - Co-advisor: Prof. Viswanath Nagarajan, University of Michigan
   - First position: Ford Motor Company

6. Hideaki Nakao, University of Michigan at Ann Arbor, PhD, May 2021
   - Thesis: "Distributionally Robust Optimization in Sequential Decision Making."
   - First position: Argonne National Lab

7. Huiwen Jia, University of Michigan at Ann Arbor, PhD, May 2022
   - Thesis: "Adaptive Optimization and Learning for Service Systems."
   - Co-advisor: Prof. Cong Shi, University of Michigan
   - First position: Amazon, Inc.

8. Xian Yu, University of Michigan at Ann Arbor, PhD, May 2022
   - Thesis: "Sequential Optimization Under Uncertainty: Models, Algorithms, and Applications."
   - First position: Assistant Professor, Department of Integrated Systems Engineering, The Ohio State University

9. Kati Moug, University of Michigan at Ann Arbor, PhD, May 2023
   - Thesis: "Sequential Decision Making in Crisis: Mitigating Risk in Marginalized Communities with Stochastic Optimization"
   - First position: Lecturer in Georgia Tech, School of ISyE.

10. Xinyu Fei, University of Michigan at Ann Arbor, PhD, December 2023
    - Thesis: "Optimization Methods for Mixed-Integer Control Problems in Complex Systems"
    - First position: Amazon

POSTDOC FELLOW SUPERVISION
1. Dr. Yang Zhan, Postdoc visitor from 2017.09-2018.09
   - Supervised by Prof. Guohua Wan in Shanghai Jiao Tong University
   - Topic: Reactive scheduling for surgical suite.

2. Dr. Bo Zhou, Postdoc research fellow, 2022.09-present
   - Web: https://bozlamberth.github.io/

- Research interests: Uncertainty analysis, robust optimization, continuous-time optimization with applications in flexibility and resilience of power/energy systems, energy storage, energy bank.

INVITED TALKS AND SEMINARS

1. "Facility Location with Competition or Decision-dependent Uncertainty: Models, Algorithms and Extensions," Department of Industrial Engineering, University of Houston, November 2022.
2. "Optimization and Data Analytics Tools for Addressing COVID-19 Related Problems," invited talk in seminar series "Providing Better Healthcare through Systems Engineering" organized by the U-M Center for Healthcare Engineering and Patient Safety (CHEPS), September 2022.
3. "Traffic Signal Control under Stochastic Traffic Demand and Vehicle Turning via Decentralized Decomposition Approaches," invited talk by the Center for Connected and Automated Transportation (CCAT) and UM Transportation Research Institute, Aug 24, 2022.
4. "Optimization Methods for Discrete Binary Quantum Control," featured invited talk in the Midwest Optimization & Statistical Learning Meeting (MO&S), Northwestern University, May 19, 2022.
5. "Facility Location with Competition or Decision-dependent Uncertainty: Models, Algorithms and Extensions," invited talk in Information Systems, Business Statistics and Operations Management (ISOM) department seminar series, Hong Kong University of Science and Technology, March 2022. (virtual)
6. "Facility Location with Competition or Decision-dependent Uncertainty: Models, Algorithms and Extensions," invited talk in seminar series, School of Computing and Augmented Intelligence, Arizona State University, February 2022. (virtual)
7. "Online Learning and Pricing for Service Systems with Reusable Resources", Next Generation Transportation Systems (NGTS) seminar series in the Department of Civil and Environmental Engineering, University of Michigan, October 2021.
8. "Sequential Competitive Facility Location: Exact and Approximate Algorithms," invited talk in seminar series, Operations Research and Industrial Engineering Program, Department of Mechanical Engineering, University of Texas at Austin, 2021. (virtual)
9. "Sequential Competitive Facility Location: Exact and Approximate Algorithms," invited speaker in the Mixed Integer Programming (MIP) Workshop, 2021. (virtual)
10. "Decision Models for Resource Allocation, Preparation and Response to Future COVID-19 Infection Uncertainty and other Disease Outbreaks," invited speaker and panelist for the COVID-19 Modeling Symposium, University of Michigan, May 2021.
11. "Multistage Distributionally Robust Mixed-Integer Programming with Decision-Dependent Moment-Based Ambiguity Sets," invited talk for seminar series, Department of Industrial and Systems Engineering, Lehigh University, March 2021. (virtual)
12. "Optimization and Data Analytics Tools for Addressing COVID-19 Related Problems," invited talk in Department seminar series, Industrial, Manufacturing & System Engineering, Texas Tech University, 2021. (virtual)
13. "Multistage Distributionally Robust Mixed-Integer Programming with Decision-Dependent Moment-Based Ambiguity Sets," invited talk for seminar series, Tippie College of Business, University of Iowa, December 2020. (virtual)
14. "Multistage Distributionally Robust Mixed-Integer Programming with Decision-Dependent Moment-Based Ambiguity Sets," invited talk for department seminar series, Department of Industrial and Systems Engineering, University of Southern California, November 2020. (virtual)

15. "Distributionally Robust Partially Observable Markov Decision Process with Application in Dynamic Epidemic Control," invited seminar talk, Operations, Planning, Accounting, and Control Group, Eindhoven University of Technology, the Netherlands, November 2020. (virtual)
16. "Optimization of COVID related logistics problems", Invited speaker for the International Fair event at Universidad de Monterrey, Mexico, November 2020. (virtual)
17. "Optimization and Data Analytics Tools for Addressing COVID-19 Related Problems," invited talk for the Big Data Ignite 2020 Webinar Series "Data-driven in Uncertain Times", September 2020. (virtual)
18. "Optimization and Data Analytics Tools for Addressing COVID-19 Related Problems," invited talk for graduate seminar series, School of Industrial and Systems Engineering, University of Oklahoma, September 2020. (virtual)
19. "Transportation & Logistics in a COVID-19 Era", invited talk in the University of Michigan, Center for Connected Automated Transportation (CCAT) lunch and learn series, May 2020. (virtual)
20. "From Data to Actions, From Observations to Solutions — A Summary of Operations Research and Industrial Engineering Tools for Fighting COVID-19" invited talk in the Michigan Institute for Data Science (MIDAS) COVID-19 Special Seminar Series, April 2020. (virtual)
21. "New results and applications of facility location involving competition, prioritization, and decision-dependent demand," invited talk in the Discrete Optimization Talks (DOTs) seminar series, April 2020. (virtual)
22. "Multistage Distributionally Robust Mixed-Integer Programming with Decision-Dependent Ambiguity Sets", invited talk in the Mixed Integer Programming Workshop, Rutgers University, May 2020. (cancelled/postponed)
23. "Stochastic and distributionally robust optimization approaches for improving shared-mobility system design and operations," invited talk for seminar series, Department of Industrial and Systems Engineering, University of Southern California, March 2020. (cancelled/postponed)
24. "New results of facility location involving competition, prioritization, and ambiguous decision-dependent uncertainty," invited plenary talk on "Optimization Applications in Smart Cities", Fields Institute at the University of Toronto, Canada, January 2020.
25. "New results of facility location involving competition, prioritization, and ambiguous decision-dependent uncertainty," transportation seminar series in the Department of Civil and Environmental Engineering, University of Michigan, November 2019.
26. "Optimization methods for carsharing and ride-hailing under Uncertainty", PhD Student Workshop on Transportation and Logistics Challenges and Opportunities, Chicago, IL, USA, May 2019.
27. "Optimization Methods for the Design and Operations of Complex Mobility Systems," Department of Industrial and Systems Engineering, University at Buffalo, SUNY, October 2018.
28. "Optimization Methods for the Design and Operations of Complex Mobility Systems," Department of Civil and Environmental Engineering, University of Michigan, September 2018.
29. "Ambiguous Chance-Constrained Binary Programs with Mean-Covariance Information," LANS Informal Seminar, Argonne National Lab, August 2018.
30. "Optimizing the profitability and quality of service in carshare systems under demand uncertainty," Department of Industrial Engineering, Tsinghua University, Beijing, China, May 2018.
31. "Optimizing the profitability and quality of service in carshare systems under demand uncertainty," Antai Business School, Shanghai Jiao Tong University, May 2018.
32. "Optimizing the profitability and quality of service in carshare systems under demand uncertainty," Department of Industrial Engineering, Peking University, Beijing, China, June 2018.
33. "Optimizing the profitability and quality of service in carshare systems under demand uncertainty," Didi Chuxing, Inc., Beijing, China, June 2018.

34. "Ambiguous chance-constrained binary programs with mean-covariance information," invited participant to Banff International Research Station (BIRS) workshop on "Distributionally Robust Optimization." BIRS, Canada, March 2018.
35. Invited participant to Institute for Mathematics and its Applications (IMA) "Industrial Mathematics Workshop and Clinic: Collaboratively Tackling Emerging Problems in Industry." University of Minnesota, Twin City, July 2017.
36. "Ambiguous Chance-Constrained Bin Packing with Mean-Covariance Information," Department of Industrial Engineering & Operations Research, University of California, Berkeley, April 2017.
37. "Distributionally Robust Chance-constrained Bin Packing," Department of Industrial Engineering & Management Science, Northwestern University, October 2016.
38. "Optimizing the Profitability and Quality of Service in Carshare Systems with Applications Beyond Transportation," Department of Industrial Engineering, Clemson University, September 2016.
39. "Parallel Scenario Decomposition of Risk Averse 0-1 Stochastic Programs," Department of Computational and Applied Mathematics, Rice University, September 2016.
40. "Distributionally Robust Chance-constrained Bin Packing," Department of Industrial and Systems Engineering, University of Wisconsin-Madison, September 2016.
41. "Distributionally Robust Chance-constrained Bin Packing," Department of Industrial and Enterprise Systems Engineering, University of Illinois at Urbana-Champaign, August 2016.
42. "Optimizing the Profitability and Quality of Service in Carshare Systems with Applications Beyond Transportation," Department of Industrial Engineering, Tsinghua University, Beijing, China, July 2016.
43. "Optimizing the Profitability and Quality of Service in Carshare Systems with Applications Beyond Transportation," Department of Management Science, School of Management, Fudan University, Shanghai China, July 2016.
44. "Parallel Scenario Decomposition of Risk Averse 0-1 Stochastic Programs," Invited talk in thematic session on "Scenario reduction, partition, and clustering in stochastic programs," the 14th International Conference on Stochastic Programming, June 2016.
45. "Parallel Scenario Decomposition of Risk Averse 0-1 Stochastic Programs," Invited talk by the 2016 Optimization Days conference, HEC Montréal, Canada, May 2016.
46. "Optimizing the Profitability and Quality of Service in Carshare Systems with Applications Beyond Transportation," Department of Integrated Systems Engineering, the Ohio State University, April 2016.
47. "Integer Programming Approaches for Appointment Scheduling with Random No-shows and Service Durations," Department of Decision Sciences, National University of Singapore, Business School, January 2016.
48. "Integer Programming Approaches for Appointment Scheduling with Random No-shows and Service Durations," Department of Industrial and Systems Engineering, Lehigh University, September 2015.
49. "Decomposition Algorithm for Optimizing Multi-Server Appointment Scheduling with Chance Constraints," School of Industrial and Systems Engineering, Georgia Institute of Technology, February 2015.
50. "Chance-Constrained Surgery Planning under Uncertain or Ambiguous Surgery Durations," Department of Systems & Industrial Engineering, University of Arizona, November 2014.

51. "Chance-Constrained Surgery Planning under Uncertain or Ambiguous Surgery Durations," Department of Operations Management, Purdue University, Krannert School of Management, October 2014.

52. "Chance-Constrained Surgery Planning under Uncertain or Ambiguous Surgery Durations," Invited technical session on "Optimal Planning in Healthcare under Uncertainty," National Science Foundation (NSF) sponsored Health Systems Optimization Workshop, September 12-13, 2014.

53. "Risk-Averse Network Interdiction and Optimizing Interdependent Infrastructures' Design and Operations under Stochastic Arc Disruptions," Argonne National Lab, Decision and Information Sciences Division, September 2014.

54. "Decomposition Algorithm for Optimizing Multi-Server Appointment Scheduling with Chance Constraints," University of Chicago, Booth Business School, September 2014.

55. "Chance-Constrained Surgery Planning under Uncertain or Ambiguous Surgery Durations," Invited talk in the mini-symposium on "Healthcare Optimization and Applications," SIAM Conference on Optimization, May 2014.

56. "Chance-Constrained Surgery Planning under Uncertain or Ambiguous Surgery Durations," School of Computing, Informatics, and Decision Systems Engineering (SCIDSE), Arizona State University, January 2014.

57. "What is Stochastic Optimization?" Invited by the "What is…" seminar series in the Department of Mathematics, University of Michigan, November 2013.

58. "Interdicting Probabilistic Shortest Paths," Invited by the 1st Annual Meeting of the Air Force Research Laboratory (AFRL) Mathematical Modeling and Optimization Institute, July 2013.

59. "Mixed-Integer Programming Models for Optimizing Risk Parameter in Chance Constraints," Invited talk in the Mini Symposium on "IP Approaches for Chance-Constrained Programs," of the 13th International Conference on Stochastic Programming, July 2013.

60. "Risk Optimization in Probabilistic Programs with Single or Multiple Chance Constraints," one of the 25 invited talks in the 9th Mixed Integer Programming Workshop, UC Davis, July 2012.

61. "Expectation and Chance-Constrained-based Models and Algorithms for Insuring Critical Paths," invited seminar talks in Peking University, Shanghai Finance and Economics University, Fudan University, and Tsinghua University in China, Summer 2012.

62. "Expectation and Chance-Constrained-based Models and Algorithms for Insuring Critical Paths," Department of Industrial Engineering, University of Arkansas, February 2011.

63. "Expectation and Chance-Constrained-based Models and Algorithms for Insuring Critical Paths," Department of Applied Mathematics, Johns Hopkins University, February 2011.

64. "Expectation and Chance-Constrained-based Models and Algorithms for Insuring Critical Paths," Department of Industrial and Operations Engineering, University of Michigan, February 2011.

65. "Expectation and Chance-Constrained-based Models and Algorithms for Insuring Critical Paths," Industrial and Systems Engineering Program, University of Minnesota-Twin Cities, January 2011.

66. "Expectation and Chance-Constrained-based Models and Algorithms for Insuring Critical Paths," University of Warwick, Warwick Business School, United Kingdom, December 2010.

67. "Expectation and Chance-Constrained-based Models and Algorithms for Insuring Critical Paths," Department of Industrial and Management Systems Engineering, University of South Florida, November 2010.

CONFERENCE PRESENTATIONS

1. "Risk-Averse Reinforcement Learning for Real-time Economic Dispatch," 2023 INFORMS Annual Meeting, Phoenix, AZ, Oct 2023.
2. "Risk-Averse Reinforcement Learning via Dynamic Time-Consistent Risk Measures," SIAM Conference on Optimization (OP23), June 2023.
3. "Risk-averse reinforcement learning via dynamic time-consistent risk measures", *the 61st IEEE Conference on Decision and Control (CDC 2022)*, Cancun, Mexico, December 2022.
4. "Binary Control Pulse Optimization for Quantum Systems", INFORMS Annual Meeting, October 2022.
5. "Optimization and Decentralized Algorithms for Traffic Signal Control under Uncertainties", INFORMS Computing Society (ICS) Conference, January 2022. (canceled)
6. "Binary Control Pulse Optimization for Quantum Systems", INFORMS Computing Society (ICS) Conference, January 2022. (canceled)
7. "Resource Distribution under Spatiotemporal Uncertainty of Disease Spread: Stochastic versus Robust Approaches," INFORMS Annual Meeting 2021 (virtual).
8. "Optimization and Data Analytics Tools for Addressing COVID-19 related Problems," poster presentation in the 2021 MIDAS Network Annual Meeting, May 11-13, 2021.
9. "Strategic Discharges for Pandemic Containment Using Multi-Criteria Markov Decision Processes," poster presentation in the 2021 MIDAS Network Annual Meeting, May 11-13, 2021.
10. "System Engineering Methods for Return to Operations During a Pandemic", Panelist for the Session "Informing Public Policy", INFORMS Annual Meeting 2020 (virtual).
11. "Scenario grouping and decomposition algorithms for chance-constrained programs", INFORMS Optimization Society Conference, Greenville, SC, March 2020. (cancelled/postponed)
12. "Benders Cut Classification via Support Vector Machines for Solving Two-stage Stochastic Programs", INFORMS Optimization Society Conference, Greenville, SC, March 2020. (cancelled/postponed)
13. "Multistage Distributionally Robust Mixed-integer Programming with Decision-dependent Ambiguity Sets", INFORMS Annual Conference, Seattle, WA, October 2019.
14. "An integrated decomposition and Approximate Dynamic Programming approach for on-demand ride pooling", INFORMS Annual Conference, Seattle, WA, October 2019.
15. "Distributionally Robust Adaptive Control under Nonstationary Uncertainty," the 23rd International Symposium of Mathematical Programming (ISMP), Boudreaux, France, July 2018.
16. "Scenario grouping and decomposition algorithms for chance-constrained programs," INFORMS Optimization Society Conference, Denver, CO, March 2018.
17. "Self-Sustained Car-and-Ride Sharing Design and Optimization for Improving the Mobility of Underserved Communities," INFORMS Transportation and Logistics Society, First Triennial Conference, Chicago, IL, July 2017.
18. "Distributionally Robust Chance-constrained Bin Packing," The fifth International Conference on Continuous Optimization (ICCOPT 2016), Tokyo, Japan, August 2016.

19. "Moment-Based Distributionally Robust Server Allocation and Appointment Scheduling Problems," 14th International Conference on Stochastic Programming, Buzios, Brazil, June 2016.

20. "Moment-Based Distributionally Robust Server Allocation and Appointment Scheduling Problems," INFORMS Annual Conference, Philadelphia, PA, November 2015.

21. "Distributionally Robust Appointment Scheduling with Random No-shows and Service Durations," OR2015, International Conference on Operations Research (Optima Decisions and Big Data), Vienne, Austria, September 2015.

22. "Risk-averse Scheduling with Random Service Durations and No-shows under Ambiguous Distributions," 22nd International Symposium of Mathematical Programming, Pittsburgh, PA, United States, July 2015.

23. "Chance-constrained Surgery Planning under Uncertain or Ambiguous Surgery Duration." The Production and Operations Management Society (POMS) Conference, Washington D.C., May 2015.

24. "Loss-constrained Minimum Cost Flow under Arc Failure Uncertainty with Applications to Risk-aware Kidney Exchange," INFORMS Computing Society Conference, Richmond, VA, January 2015.

25. "Distributionally Robust Appointment Scheduling with Random Service Durations and No-shows," INFORMS Computing Society Conference, Richmond, VA, January 2015.

26. "Sensor Deployment for Stochastic Traffic Congestion Observation," INFORMS Annual Conference, San Francisco, CA, November 2014.

27. "Sensor Placement for Stochastic Traffic Congestion Observation," INFORMS Transportation Science and Logistics Society Workshop, June 2014.

28. "Chance-constrained surgery planning under uncertain or ambiguous surgery duration." The Manufacturing & Service Operations Management (MSOM) Conference, June 2014.

29. "Multi-stage Decomposition for Optimizing Integrated Allocation and Scheduling," INFORMS Optimization Society Conference, March 2014.

30. "Data Analytics, Risk Management, and Optimization Under Uncertainty," INFORMS Southeast Michigan Symposium, November 2013.

31. "What is Stochastic Optimization?" in the "What is…" seminar series in the Department of Mathematics, University of Michigan, November 2013.

32. "Stochastic Modeling Approaches for Managing Energy Footprints and Cloud Computing Service," Service-Science Cluster Best Paper Award Competition Session, INFORMS Annual Conference, October 2013.

33. "Robust Weight Optimization of Return and Reliability in Multi-Portfolio Optimization," INFORMS Annual Conference, Minneapolis, MN, Oct. 2013.

34. "Robust and Semi-robust Network Design under Demand and Topological Uncertainty," INFORMS Annual Conference, Minneapolis, MN, Oct. 2013.

35. "Interdicting Probabilistic Shortest Paths: Models, Algorithms, and Applications," INFORMS Annual Conference, Minneapolis, MN, Oct. 2013.

36. "Monitoring Quality and Fairness of Service in Stochastic Operating Room Allocation and Scheduling," INFORMS Healthcare Conference, Chicago, IL, June 2013.

37. "Two-Stage Models and Algorithms for Optimizing Infrastructure Design and Recovery Operations under Stochastic Disruptions," INFORMS Computing Society Conference, Santa Fe, NM, January 2013.

38. "Chance-Constrained Programming Models and Approximation Algorithms for the Balanced-Constrained Stochastic Bottleneck Spanning Tree Problem," INFORMS Computing Society Conference, Santa Fe, NM, January 2013.

39. "Risk and Energy Consumption Tradeoffs in Cloud Computing Service via Stochastic Optimization Models," International Workshop on Clouds and (eScience) Applications Management at IEEE/ACM UCC 2012, Chicago, IL, Nov. 2012.

40. "Risk Optimization in Joint Chance-Constrained Programming," INFORMS Annual Conference, Phoenix, AZ, Oct. 2012.

41. "Risk Interdiction and Risk-and-Return Tradeoffs in Probabilistic Programs with Single or Multiple Chance Constraints," 21st International Symposium of Mathematical Programming, Berlin, Germany, Aug. 2012.

42. "Modeling Minimum Flow Cost Problems under Stochastic Arc Failures," INFORMS Optimization Society Conference, Miami, FL, Feb. 2012.

43. "Exact Interdiction Models and Algorithms for Disconnecting Networks via Node Deletions," INFORMS Optimization Society Conference, Miami, FL, Feb. 2012.

44. "Exact Interdiction Models and Algorithms for Disconnecting Networks via Node Deletions," INFORMS Annual Conference, Charlotte, NC, Nov. 2011.

45. "Optimal Dynamic Energy Management for Smart Grid Consumers," INFORMS Annual Conference, Charlotte, NC, Nov. 2011.

46. "Exact Interdiction Models and Algorithms for Disconnecting Networks via Node Deletions," INFORMS Computing Society Conference, Monterey, CA, Jan., 2011.

47. "Expectation and Chance-Constrained-based Models and Algorithms for Insuring Critical Paths," INFORMS Annual Conference, Austin, TX, Nov. 2010.

48. "Exact Interdiction Models and Algorithms for Disconnecting Networks via Node Deletions," INFORMS Southern Regional Conference, Huntsville, AL, April, 2010.

49. "Two-stage Stochastic Integer Programming for Angiogenesis and Vascular Network Design," INFORMS Annual Conference, San Diego, CA, Oct. 2009.

50. "Expectation and Chance Constrained Models and Algorithms for Insuring Critical Paths," 20th International Symposium of Mathematical Programming, Chicago, IL, Aug. 2009.

51. "Expectation and Chance Constrained Models and Algorithms for Insuring Critical Paths," 11th INFORMS Computing Society Conference, Charleston, SC, Jan. 2009.

52. "Solving Stochastic Dispatching and Routing Problem in Emergency Response Service Using Approximate Dynamic Programming," INFORMS Annual Conference, Seattle, WA, Nov. 2007.

TEACHING

New course introduced in UM:

IOE 691. Special Topics on Stochastic and Robust Optimization, Winter 2013, Fall 2014
Graduate course; new course developed, University of Michigan

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Topics: Sampling methods, stochastic mixed-integer programming models, decomposition methods, large-scale optimization, stochastic dynamic programming, approximation algorithms, chance-constrained programming, theories and applications of robust optimization, discussions of data driven models and relationship between different stochastic programs. (Co-instruct with Prof. M. Epelman)

IOE 591: Special Topic on Transportation System Optimization, Fall 2021
Graduate course, University of Michigan
Topics: Examples of smart transportation, mobility and logistic systems and their use in modern society. Introduction of networks and network flow models for these systems and how to optimize resource planning and operational decisions related to smart mobility and transportation. Descriptions of different decision-making models and solution approaches for specific problems related to the use of smart transportation in industry.

Other courses:

EIN 4343. Inventory and Supply Chain Systems, Fall 2009
Undergraduate senior course, University of Florida
Topics: Demand forecasting, inventory control, EOQ model, news-vendors problem, fundamentals of linear programming and network optimization, classical network flow models, the bullwhip effect, facility location problem, capacitated/incapacitated lot-sizing problem, supply chain risk management.

IOE 310. Introduction to Optimization, Winter 2014, 2015, 2016, Fall 2018
Undergraduate senior course, University of Michigan
Topics: Matrix operations, basic convex analysis, mathematical modeling with emphasis on linear programming; introduction to integer programming, network optimization, and dynamic programming; simplex algorithms, engineering applications, relevant software (e.g., Excel solver, AMPL).

IOE 510. Linear Programming I, Fall 2011-2019, Fall 2022
Graduate course, University of Michigan
Topics: Mathematical modeling, linear algebra and matrices, the simplex algorithm, duality theory and optimality conditions, sensitivity analysis, network flows, combinatorial optimization, computations in AMPL, basics in decomposition, integer programming, and stochastic optimization.

IOE 512. Dynamic Programming, Fall 2020-2022
Graduate course, University of Michigan
Topics: The techniques of recursive optimization and their use in solving multistage decision problems, applications to various types of problems, including an introduction to Markov decision processes.

IOE 612. Network Flows, Winter 2012, Fall 2013, 2015, 2016, 2017, Winter 2019, Fall 2020
Graduate course, University of Michigan
Topics: Basic graph theories, minimum cost flow, shortest path, minimum spanning tree, maximum flow (minimum cut), network simplex method, network interdiction and applications in homeland security, social networks, and epidemic control.

ENGR 455. <u>Multidisciplinary Project Design</u>, 2012
Multidisciplinary course, University of Michigan
Co-instructed with Prof. Amy Cohn and James Goebel.
Topics: This course collaborates with the Habitat for Humanity International, and optimizes transitional shelter construction in Haiti. We design an intervention process for an at-scale post-disaster shelter intervention that (a) provides immediate relief in the form of low-cost, easily-produced transitional shelter and (b) integrates seamlessly into an on-going incremental shelter process based on local housing resources, and that leverages and augments livelihoods and micro-entrepreneurship. Course contents include decision tree analysis, supply chain guideline developments based on local inputs and outsourcing risk management.

ENGR 455. <u>Multidisciplinary Project Design</u>, 2016
Multidisciplinary course, University of Michigan
Topics: This course collaborates with Union Pacific as the largest railroad in North America moving many different types of cargo using many different types of equipment. Refrigerated cars are particularly expensive assets. We aim to employ data analytics and modeling tools, to design effective procedures for using them in an optimal manner, making sure they are optimally fueled for transcontinental hauls, taken off-line for timely maintenance, etc.

STUDENTS AND COMMITTEE

<u>Doctoral Students (current)</u>

1. Kevin Smith (co-advised by Brian Denton; 2020-present)
2. Juan Alberto Estrada Garcia (2022-present)

<u>Doctoral Students (graduated):</u>

1. Yan Deng (2012-2016; first position: Google)
2. Zhihao Chen (2012-2016; first position: Amazon)
3. Yuchen Jiang (co-advised by C. Shi; 2013-2018; first position: Uber)
4. Yiling Zhang (co-advised by R. Jiang; 2015-2019; first position: Assistant Professor in the Department of Industrial and Systems Engineering, University of Minnesota)
5. Miao Yu (co-advised by V. Nagarajan; 2016-2020; first position: Ford Motor Company)
6. Hideaki Nakao (2016-2021; first position: Postdoc fellow at the Argonne National Lab)
7. Xian Yu (2017-2022; first position: Assistant Professor in the Department of Integrated Systems Engineering, Ohio State University)
8. Huiwen Jia (co-advised by Cong Shi; 2018-2022; first position: Amazon)
9. Kati Moug (2019-2023; first position: Lecturer in Georgia Tech, ISyE)
10. Xinyu Fei (2019-2023; first position: Amazon)

<u>Master Students:</u>
- Yanru Guo (2022-present)
- Gongyu Chen (2020-2022)
- Lauren Moore (2021-2022)
- Haoming Shen (2017-2018)
- Huiwen Jia (2017-2018)

- Yiling Zhang (2014-2015)
- Mingdi You (2012-2013)
- Jue Wang (2012-2013)
- Andrew Orso (co-advised by J. Lee; 2013-2015)

Ph.D. Committees:
At University of Michigan:

- Dr. Xinyu Fei, IOE, University of Michigan, PhD defense, 2023.
- Dr. Mingjie Bi, Department of Robotics, University of Michigan, PhD defense, 2023.
- Dr. Zhen Yang, CEE, University of Michigan, PhD defense, 2022.
- Mingjie Bi, Robotics Institute, University of Michigan. PhD candidacy, 2022.
- Kevin Smith, IOE, University of Michigan. PhD candidacy, 2021.
- Dr. Xian Yu, IOE, University of Michigan, PhD defense, 2022.
- Dr. Huiwen Jia, IOE, University of Michigan, PhD defense, 2022.
- Xinyu Fei, IOE, University of Michigan. PhD candidacy, 2021.
- Kati Moug, IOE, University of Michigan. PhD candidacy, 2021.
- Dr. Hideaki Nakao, IOE, University of Michigan, PhD defense, 2021.
- Dr. Mengqi Yao, ECE, University of Michigan. PhD defense, 2020.
- Dr. Miao Yu, IOE, University of Michigan. PhD defense (co-chair), 2020.
- Dr. Minseok Ryu, IOE, University of Michigan. PhD defense, 2020.
- Huiwen Jia, IOE, University of Michigan. PhD candidacy, 2019.
- Xian Yu, IOE, University of Michigan. PhD candidacy, 2019.
- Junhong Guo, IOE, University of Michigan, PhD candidacy, 2019.
- Luze Xu, IOE, University of Michigan, PhD candidacy, 2019.
- Dr. Hao Yuan, IOE University of Michigan, PhD defense, March 2019.
- Mengqi Yao, ECE, University of Michigan. PhD candidacy, 2019.
- Dr. Yiling Zhang, IOE, University of Michigan. PhD defense (co-chair), March 2019.
- Hideaki Nakao, IOE, University of Michigan, PhD candidacy, May 2018.
- Dr. Yuchen Jiang, IOE, University of Michigan. PhD defense (co-chair), February 2018.
- Dr. Yiran Liang, ME, University of Michigan. PhD defense, February 2018.
- Zhiyuan Huang, IOE, University of Michigan. PhD candidacy, May 2017.
- Miao Yu, IOE, University of Michigan. PhD candidacy, April 2017.
- Minseok Ryu, IOE, University of Michigan. PhD candidacy, April 2017.
- Dr. Emily Speakman, IOE, University of Michigan. PhD defense, March 2017.
- Dr. Kayse Maass, IOE, University of Michigan. PhD defense, February 2017.
- Yiling Zhang, IOE, University of Michigan. PhD candidacy, May 2016.
- Qi He, IOE, University of Michigan. PhD candidacy, May 2016.
- Dr. Liang Ding, Technology & Operations, Stephen M. Ross School of Business, U of Michigan. PhD defense, May 2016.
- Dr. Zohar Strinka, IOE, University of Michigan. PhD defense, March 2016.
- Dr. Zhihao Chen, IOE, University of Michigan. PhD defense (chair), February 2016.

- Dr. Yan Deng, IOE, University of Michigan. PhD defense (chair), February 2016.
- Yuchen Jiang, IOE, University of Michigan. PhD candidacy, May 2015.
- Liang Ding, Technology & Operations, Stephen M. Ross School of Business, U of Michigan. PhD candidacy, April 2015.
- Kayse Maass, IOE, University of Michigan. PhD candidacy, June 2014.
- Zhihao Chen, IOE, University of Michigan. PhD candidacy, May 2014.
- Yan Deng, IOE, University of Michigan. PhD candidacy, May 2014.
- Dr. Hao Zhou, IOE, University of Michigan. PhD defense, Sept. 2013.
- David Escott, IOE, University of Michigan. PhD candidacy, May 2013.
- Dr. Li Yang, IOE, University of Michigan. PhD defense, April 2012.
- Dr. Jin Hu, CSE, University of Michigan. PhD defense, October 2012.
- Dr. Kathryn Schumacher, IOE, University of Michigan. PhD defense, March 2014.
- Zohar Strinka, IOE, University of Michigan. PhD candidacy, May 2012.
- Yiran Liang, ME, University of Michigan. PhD candidacy, Nov. 2012.

Other Universities:
- Beste Basciftci, Georgia Institute of Technology, 2018.
- Dr. Nguyen The Hung, Virginia Commonwealth University, PhD defense, June 2018.
- Nguyen The Hung, Virginia Commonwealth University, PhD candidacy, June 2016.

Undergraduate Major Projects Directed
- Summer Undergraduate Research in Engineering (SURE) program, "Covid-19 Impacts on Mobility and Transportation," Juan Alberto Estrada García, undergraduate junior at University of Monterrey, Mexico.
- Summer Undergraduate Research in Engineering (SURE) program, "Covid-19 Impacts on Mobility and Transportation," Jorge Alberto Ramírez García, undergraduate junior at University of Monterrey, Mexico.
- Summer Undergraduate Research Studies, "An interactive game to evaluate reopen and closedown strategies during COVID-19 pandemic," Ryan Dacosta, undergraduate sophomore in the Department of Industrial and Operations Engineering, University of Michigan.
- Summer Undergraduate Research Studies, "Understanding COVID-19 Infections in Michigan," Theodore Sweeny, undergraduate junior in Data Science, University of Michigan.
- Multidisciplinary Design Program, "Optimal Utilization and Management of Refrigerated Train Car Fleet," five UM undergraduates & master students involved, Winter 2016-Fall 2016.
- Marian Sarah Parker Scholars Program, Women in Science and Engineering (WISE), "Optimizing Environmental Impacts and Social Welfare of Car Sharing." one UM female sophomore involved, Summer 2015.
- Multidisciplinary Design Program, "Emergency Market Mapping Analysis (EMMA) Adaptation for the Habitat for Humanity International (HfHI) Shelter Relief," five UM undergraduates involved, co-advise with Prof. A. Cohn and James Goebel, Winter – Fall 2012.
- Summer Research Opportunity Program (SROP), "A Dynamic Model for a Mobile Healthcare Facility Routing Problem," co-advise with Prof. M. Lavieri, one undergraduate from the University of Puerto Rico involved (who later became a PhD student at IOE), Summer 2012.

- Marian Sarah Parker Scholars Program, Women in Science and Engineering (WISE), "Using Network Optimization Tools for Shelter Relief in Haiti," one UM female junior student involved, Summer 2012. (The paper is one of the technical paper competition finalists in 2013 IIE Great Lakes Regional Conference.)

PROFESSIONAL MEMBERSHIP

- The Institute for Operations Research and Management Science (INFORMS)
- Mathematical Optimization Society (MOS)
- Society for Industrial and Applied Mathematics (SIAM)
- Institute of Industrial and Systems Engineers (IISE)
- Institute of Electrical and Electronics Engineers (IEEE)

EDITORIAL EXPERIENCE
- Guest Editor:
    - Special issue of "Optimization in Military Applications," *Optimization Letters*, September 2015.

- Editorial Board/Associate Editor
    - *Operations Research (2024-present)*
    - *Manufacturing & Service Operations Management* (2021-present)
    - *European Journal of Operational Research (2022-2025)*

- Past Editorial Board Service
    - *Networks* (2019-2022)
    - *IISE Transactions* (2018-2023)
    - *Service Science* (2019-2023)
    - *INFORMS Journal on Computing* (2019-2023)
    - *Transportation Science* (2021-2023)

- Reviewer:
    - *Operations Research*
    - *Mathematical Programming*
    - *Management Science*
    - *SIAM Journal on Optimization*
    - *INFORMS Journal on Computing*
    - *Decision Analysis*
    - *IISE Transactions*
    - *IISE Transactions on Healthcare Systems Engineering*
    - *Networks*
    - *Transportation Science*
    - *IEEE Transactions on Power Systems*
    - *Naval Research Logistics*
    - *Discrete Optimization*
    - *European Journal of Operational Research*

- o *Computers & Operations Research*
- o *Optimization Letters*
- o *Operations Research Letters*
- o *Journal of Global Optimization*
- o *OMEGA*
- o *Journal of Optimization Theory and Applications*
- o *Transportation Research Part B*
- o *Transportation Research Part C*
- o *Transportation Research Part E*
- o *Transportation*
- o *Production and Operations Management*
- o *Manufacturing & Service Operations Management*
- o *Risk Analysis*
- o *Journal of Heuristics*
- o *Journal of Scheduling*
- o *Computational Optimization and Applications*
- o *Computational Management Science* and others.

EXTRAMURAL SERVICE
- INFORMS Board Nominating Committee, 2023-2024.
- Award Committee Co-chair, 2024 INFORMS George Nicholson Student Paper Competition
- Judge Committee Member, 2023 INFORMS George Nicholson Student Paper Competition.
- Scientific Committee member for the 2023 Transportation Science & Logistics (TSL) Conference, Loyola University, Chicago.
- Judge Committee Member, 2022 INFORMS George Nicholson Student Paper Competition.
- Panel Reviewer for Department of Energy, Early Career Program and several programs in the National Science Foundation, 2022.
- Faculty mentor, "To My Younger Self" (TMYS) mentoring project, organized by the INFORMS DEI Ambassadors program, 2022.
- Judge Committee Member, 2021 INFORMS JFIG (Junior Faculty Interest Group) paper competition.
- Elected member, Board of INFORMS Computing Society, 2021-2023.
- Track Chair (lead), Operations Research track, IISE Annual Conference, 2021.
- Judge Committee Member, 2020 INFORMS Optimization Society Young Researcher Prize.
- Judge Committee Member, Mixed Integer Programming (MIP) 2020 Student Poster Award.
- General Associate Chair for 2022 INFORMS Annual Meeting.
- Scientific Committee member for the 2020 Transportation Science & Logistics (TSL) Conference, George Mason University.
- Track Chair, INFORMS Optimization Society Conference, Greenville, SC, 2020.
- Chair for INFORMS Annual Meeting New Faculty Colloquium (NFC) organization committee, 2019-2020.
- Optimization Society representative on the INFORMS Subdivisions Council, 2019-2020.

- Scientific Committee member for the 2019 International Conference on Stochastic Programming (ICSP), Trondheim, Norway.
- Panelist for Junior Faculty Interest Group at the INFORMS Annual Meeting, 2018.
- Local Committee Member, the 20th Conference on Integer Programming and Combinatorial Optimization (IPCO XX), May 2019.
- Vice Chair of Global Optimization SIG, INFORMS Optimization Society.
- Scribe, Workshop on "Broader Impacts", National Science Foundation, May 2016.
- Program Committee & Local Committee Member, the 12th Mixed-Integer Programming (MIP) Workshop, May 2015.
- Vice President of Meeting, INFORMS Women in Operations Research/Management Science, 2015-2016
- Junior Vice President of Meeting, INFORMS Women in Operations Research/Management Science, 2014-2015.
- Invited session chair, Production and Operations Management Society (POMS) Conference, 2015.
- Invited session chair, International Symposium of Mathematical Programming (ISMP), 2012 and 2015.
- Invited session chair, OR2015, the International conference on Operations Research (Optima Decisions and Big Data), 2015.
- Prize committee chair of the INFORMS Women in Operations Research/Management Science Student Travel Award to the Industry Professional Colloquium (IPC) at the INFORMS Business Analytics and Operations Research Conference, March 2014.
- Prize committee chair of INFORMS Award for the Advancement of Women in Operations Research/Management Science, October 2013.
- Scribe, workshop on "Operations Research - A Catalyst for Engineering Grand Challenges", National Science Foundation, July 2012 – October 2013.
- Track co-chair, "Optimization under uncertainty," 2012 the Industrial and Systems Engineering Research Conference (IIE Annual Conference).