

# SHIXUAN ZHANG

## CONTACT

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Address: 4032 Emerging Technologies Bldg, 3131 TAMU, College Station, TX 77843

Phone: +1 (979) 458-2362

Email: shixuan.zhang@tamu.edu

## PROFESSIONAL EXPERIENCES

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- Assistant Professor, Wm Michael Barnes '64 Department of Industrial & Systems Engineering, Texas A&M University 2023–Present
- Postdoctoral Fellow, Institute for Computational and Experimental Research in Mathematics (ICERM), Brown University 2022–2023
- Visiting Scholar, Sloan School of Management, Massachusetts Institute of Technology 2022

## EDUCATION

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- Ph.D. in Operations Research, Georgia Institute of Technology, Atlanta, Georgia 2017–2022
- B.S. in Mathematics and Physics, Tsinghua University, Beijing 2013–2017

## PUBLICATIONS AND PREPRINTS

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(Corresponding author is marked by c. Works with alphabetical author ranking are indicated by  $\alpha$ .)

- $\alpha$  Grigoriy Blekherman, Rainer Sinn, Mauricio Velasco, and **Shixuan Zhang**. “Spurious local minima in nonconvex sum-of-squares optimization.” arXiv preprint arXiv:2411.02208 (2024).
- **Shixuan Zhang**, and Xu Andy Sun. “On Distributionally Robust Multistage Convex Optimization: Data-driven Models and Performance.” arXiv preprint arXiv:2210.08433 (2022).
- **Shixuan Zhang** and Xu Andy Sun. “On Distributionally Robust Multistage Convex Optimization: New Algorithms and Complexity Analysis.” arXiv preprint arXiv:2010.06759 (2020).
- $\alpha$  Jesús A. De Loera, Brittney Marsters, Luze Xu<sup>c</sup>, and **Shixuan Zhang**. “Integer points in arbitrary convex cones: the case of the PSD and SOC cones.” Mathematical Programming (2025): 1-25.
- Ignacio Aravena<sup>c</sup>, Daniel K. Molzahn, **Shixuan Zhang**, Cosmin G. Petra, Frank E. Curtis, Shenyinying Tu, Andreas Wächter et al. “Recent developments in security-constrained AC optimal power flow: Overview of Challenge 1 in the ARPA-E Grid Optimization Competition.” Operations research 71, no. 6 (2023): 1997-2014.
- Amin Gholami, Kaizhao Sun, **Shixuan Zhang**, and Xu Andy Sun<sup>c</sup>. “An ADMM-Based Distributed Optimization Method for Solving Security-Constrained Alternating Current Optimal Power Flow.” Operations Research 71, no. 6 (2023): 2045-2060.
- Christian Füllner<sup>c</sup>, **Shixuan Zhang**, Steffen Rebennack, Andy Sun. “Stochastic Dual Dynamic Integer Programming (SDDiP).” In Encyclopedia of Optimization, pp. 1-11. Cham: Springer International Publishing, 2022.
- **Shixuan Zhang** and Xu Andy Sun<sup>c</sup>. “Stochastic Dual Dynamic Programming for Multistage Stochastic Mixed-Integer Nonlinear Optimization.” Mathematical Programming 196, no. 1 (2022): 935-985.

- **Shixuan Zhang**, Sheng Liu, Tianhu Deng<sup>c</sup>, and Zuo-Jun Max Shen. "Transient-State Natural Gas Transmission in Gunbarrel Pipeline Networks." *INFORMS Journal on Computing* 32, no. 3 (2020): 697-713.
- Tianhu Deng, Yong Liang<sup>c</sup>, **Shixuan Zhang**, Jingze Ren, and Shuyi Zheng. "A Dynamic Programming Approach to Power Consumption Minimization in Gunbarrel Natural Gas Networks with Nonidentical Compressor Units." *INFORMS Journal on Computing* 31, no. 3 (2019): 593-611.

## HONORS AND AWARDS

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| • Outstanding Contribution in Reviewing for <i>Operations Research Letters</i> | 2022        |
| • ICERM Institute Postdoctoral Fellowship                                      | 2022        |
| • Honorable Mention for INFORMS Optimization Society Best Student Paper Prize  | 2021        |
| • Prize winning team (GMI-GO) in the ARPA-E Grid Optimization Competition      | 2019 & 2021 |

## TEACHING

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| • Operations Research I (ISEN 320)             | Spring 2025 |
| • Operations Research I (ISEN 320)             | Fall 2024   |
| • Nonlinear and Dynamic Programming (ISEN 623) | Spring 2024 |
| • Operations Research I (ISEN 320)             | Fall 2023   |

## INVITED TALKS

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- Moment Relaxations for Wasserstein Distributionally Robust Optimization, INFORMS Annual Meeting 2024
- Local minima in nonconvex sum-of-square optimization via syzygies, SIAM Louisiana-Texas Section 2024
- Local minima in nonconvex sum-of-square optimization via syzygies, MEGA 2024, Leipzig
- Local minima in nonconvex sum-of-square optimization via syzygies, 25th International Symposium on Mathematical Programming 2024
- Local minima in nonconvex sum-of-square optimization via syzygies, UC Davis Mathematics of Data and Decisions (MADD) Seminar, May 2024
- Certification of Sums of Squares via Low-rank Optimization, INFORMS Optimization Society Meeting 2024
- Burer-Monteiro Method for Low-rank Sum-of-square Certification, INFORMS Annual Meeting 2023
- Dual Dynamic Programming for Data-driven Distributionally Robust Multistage Convex Optimization, ICSP 2023
- Burer-Monteiro Method for Low-rank Sum-of-square Certification, AMS Southeast Sectional Meeting 2023
- Dual Dynamic Programming for Data-driven Distributionally Robust Multistage Convex Optimization, INFORMS Annual Meeting 2022
- Dual Dynamic Programming for Data-driven Distributionally Robust Multistage Convex Optimization, International Conference on Continuous Optimization 2022
- Dual Dynamic Programming for Data-driven Distributionally Robust Multistage Convex Optimization, INFORMS Optimization Society Meeting 2022

- New Algorithms and Complexity Analysis for Distributionally Robust Multistage Convex Optimization, INFORMS Annual Meeting 2021
- Iteration Complexity for Stochastic Dual Dynamic Programming Algorithms, SIAM Southeastern Atlantic Section Conference 2021
- Complexity for Multistage Distributionally Robust Dual Dynamic Programming, SIAM Conference on Optimization 2021
- Generalized Conjugacy Method for Nonconvex Stochastic Optimization in Power Systems, INFORMS Annual Meeting 2020
- Stochastic Dual Dynamic Programming Algorithm for Multistage Stochastic Mixed-integer Nonlinear Optimization, MIP Workshop 2020
- Stochastic Dual Dynamic Programming Algorithm for Nonconvex Multistage Optimization Problems, INFORMS Annual Meeting 2019
- New Algorithms for Solving the Natural Gas Transient Scheduling Problem, ISE Annual Meeting 2019
- A Minor Perspective on Rank Constrained Optimization, INFORMS Annual Meeting 2018

## ACADEMIC SERVICES

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### Journal Reviews (counts since 2022)

- Mathematical Programming (3)
- Operations Research (2)
- European Journal of Operational Research (1)
- Journal of Global Optimization (2)
- Operations Research Letters (3)
- IEEE Transactions on Power Systems (17)
- IEEE Transactions on Control of Network Systems (2)

### Grant Reviews

- Panel Reviewer, NSF Civil Infrastructure Systems

### Thesis Committees

- Kevin Shu, Georgia Institute of Technology, 2024
- Hyuk Park, University of Illinois Urbana-Champaign, 2024

### Departmental Services

- Faculty Search Committee, 2024-2025
- Graduate Affairs Committee, 2023-2024

### Academic Conference Services

- Session Chair, *Mitigating Distributional Ambiguity in Stochastic Programming* in INFORMS Annual Meeting 2024
- Session co-Chair, *Theory, Algorithms, and Applications of Multistage Optimization* in INFORMS Annual Meeting 2022