Di Hou

National University of Singapore

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Education

Ph.D. Candidate in Mathematics | Advisor: Prof. Kim-Chuan Toh   2022 - Present
Department of Mathematics, National University of Singapore,   Singapore

Bachelor of Science in Mathematics (Honors)   2018 - 2022
Department of Mathematics, Jilin University,   Changchun, China

Research Interests

- Optimization

- Scientific computing

Publications and Preprints

[1] **Di Hou**, Tianyun Tang, Kim-Chuan Toh. A low-rank augmented Lagrangian method for Polyhedral-SDP and Moment-SOS relaxations of polynomial optimization. (2025), submitted.

[2] **Di Hou**, Tianyun Tang, Kim-Chuan Toh. RiNNAL+: a Riemannian ALM solver for SDP-RLT relaxations of mixed-binary quadratic programs. *Mathematical Programming Computation* (2025), accepted.

[3] **Di Hou**, Tianyun Tang, Kim-Chuan Toh. A Low-rank ALM for doubly nonnegative relaxations of mixed-binary quadratic programs. *Operations Research* (2025), accepted.

[4] **Di Hou**, Ling Liang, Kim-Chuan Toh. A sparse smoothing Newton method for solving discrete optimal transport problems. *ACM Transactions on Mathematical Software*, 50 (2024), pp. 1-26.

[5] Jinda Yang, Haiming Song, Xinxin Li, **Di Hou**. Block mirror stochastic gradient method for stochastic optimization. *Journal of Scientific Computing*, 94 (2023).

Teaching

- MA4260 Stochastic Operations Research, semester 2, AY 2025/26

- DSA2102 ssential Data Analytics Tools: Numerical Computation, semester 2, AY 2024/25

- MA 3236 Non-Linear Programming, semester 1, AY 2024/25

- DSA3102 Essential Data Analytics Tools: Convex Optimisation, semester 2, AY 2023/2024

- DSA3102 Essential Data Analytics Tools: Convex Optimisation, semester 1, AY 2023/2024

Talks

- "A Low-rank Augmented Lagrangian Method for Polyhedral–SDP and Moment-SOS Relaxations of Polynomial Optimization", Mini Workshop on Optimization, National University of Singapore, Dec 2025.

- "RiNNAL+: a Riemannian ALM solver for SDP-RLT relaxations of MBQP", The 8th PKU Workshop for Outstanding PhD Students in Computational and Applied Mathematics, Peking University, Beijing, China, Nov. 2025.

- "RiNNAL+: a Riemannian ALM solver for SDP-RLT relaxations of MBQP", International Conference on Continuous Optimization (ICCOPT) 2025, Los Angeles, California, U.S., July 2025.

- "A Sparse Smoothing Newton Method for Solving Discrete Optimal Transport Problem", NUS-SJTU PhD Forum, National University of Singapore, Nov 2024.

Recognitions

- Faculty of Science PhD Conference Award, NUS, 2025.

- President's Graduate Fellowship, NUS, Singapore, 2022-2026.

- Graduate Tutor Merit Award, NUS, Singapore, 2024, 2025.

- Top Ten Undergraduate Student Award, Changchun Province, China, 2022.

- Top Ten Undergraduate Student Award, Jilin University, China, 2022.

- National First Prize Award, Chinese Mathematics Competitions, 2021.

- National Scholarship, China, 2018-2022.

Service

Referee for Journals:

- Optimization Methods and Software

- ACM Transactions on Mathematical Software

- Optimization and Engineering

- Numerical Algebra, Control and Optimization

University services

- President of NUS SIAM Student Chapter, Jul. 2025 – Present.

- Vice president of NUS Mathematics Graduate Society, Jul. 2025 – Present.