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Hong Kong Baptist University https://www.math.hkbu.edu.hk/~xdtang

Curriculum Vitae

TANG Xindong

RESEARCH AREAS

- Numerical and Polynomial Optimization
- Generalized Nash Equilibrium Problems
- Tensor Computation
- Applications and Data Science

EDUCATION

B. S. in Mathematics: Sichuan University Sep 2012-July 2016

Ph. D. in Mathematics: University of California San Diego Sep 2016-June 2021
Advisor: Jiawang Nie

ACADEMIC APPOINTMENTS

- Aug 2023 – Present: *Assistant Professor*, Department of Mathematics, Hong Kong Baptist University
- Sep 2021 – Aug 2023: *Research Assistant Professor*, Department of Applied Mathematics, The Hong Kong Polytechnic University

AWARDS AND HONORS

- Powell Dissertation Fellowship, UCSD, 2021

RESEARCH GRANTS

- 01/2024-12/2026: Principal Investigator, Science Fund for Young Scholars（青年科学基金项目）, NSFC

  "Numerical methods for solving polynomial variational inequality problems via Lagrange multiplier expressions" (RMB¥300,000)

- 01/2024-12/2026: Principal Investigator, GRF grant

  "New methods for solving nonconvex and singular generalized Nash equilibrium problems via polynomial optimization" (HK$602,971)

- 08/2023-02/2026: Principal Investigator, Start-up Fund, Hong Kong Baptist University (HK$200,000)

- 12/2021-08/2023: Principal Investigator, Start-up Fund, The Hong Kong Polytechnic University *"Novel Approaches for Finding Local Generalized Nash Equilibria"* (HK$250,000)

PREPRINTS

1. J. Nie, Z. Qu, X. Tang, and L. Zhang, Sparse Polynomial Optimization with Matrix Constraints, *arXiv preprint* (2024) arXiv: 2411.18820
2. J. Choi, J. Nie, X. Tang, and S. Zhong, Generalized Nash equilibrium problems with quasi-linear constraints, *arXiv preprint* (2024) arXiv:2405.03926

JOURNAL PUBLICATIONS

1. J. Nie, Z. Qu, X. Tang, and L. Zhang, A characterization for tightness of the sparse Moment-SOS hierarchy, *Mathematical Programming.* To appear
2. X. Tang, M. Zhang, W. Zhong, A polynomial optimization framework for polynomial quasi-variational inequalities with Moment-SOS relaxations, *Numerical Algebra, Control and Optimization,* (2024) doi: 10.3934/naco.2024054.
3. Y. Li, C. Zheng, K. Chen, Y. Xie, X. Tang, M.Y. Wang, J. Ma, Collision-free trajectory optimization in cluttered environments with sums-of-squares programming, *IEEE Robot. Autom. Lett.* (2024), 9.12, (2024): 11026-11033.
4. J. Nie, D. Sun, X. Tang, and M. Zhang. Solving polynomial variational inequality problems via Lagrange multiplier expressions and Moment-SOS relaxations, *Computational Optimization and Applications,* 90 (2024): 361-394.
5. J. Nie, K. Ranestad, and X. Tang. Algebraic degrees of generalized Nash equilibrium problems, *Science China Mathematics*, (2025) doi.org/10.1007/s11425-023-2305-y
6. Y. Li, X. Tang, K. Chen, C. Zheng, H. Liu, and J. Ma. Geometry-Aware Safety-Critical Local Reactive Controller for Robot Navigation in Unknown and Cluttered Environments, *IEEE Robot. Autom. Lett.* (2024), 9.4, (2024): 3419-3426.
7. Z. Qu and X. Tang. A correlatively sparse Lagrange multiplier expression relaxation for polynomial optimization, *SIAM Journal on Optimization,* 34.1 (2024): 127-162.
8. J. Nie and X. Tang. Nash equilibrium problems of polynomials, *Mathematics of Operations Research,* 49.2 (2024): 1065-1090
9. J. Nie, X. Tang, and S. Zhong. Rational generalized Nash equilibrium problems, *SIAM Journal on Optimization*, 33.3 (2023): 1587-1620.
10. K. Lee and X. Tang. On the polyhedral homotopy method for solving generalized Nash equilibrium problems of polynomials, *Journal of Scientific Computing,* 95.1 (2023): 1-26.
11. J. Nie, X. Tang, Z. Yang, and S. Zhong. Dehomogenization for completely positive tensors, *Numerical Algebra, Control and Optimization,* 13.2 (2023): 340-363.

12. J. Nie and X. Tang. Convex generalized Nash equilibrium problems and polynomial optimization, *Mathematical Programming,* 198 (2023): 1485-1518.
13. J. Nie, X. Tang, and L. Xu. The Gauss-Seidel method for generalized Nash equilibrium problems of polynomials, *Computational Optimization and Applications,* 78 (2021): 529-557.
14. H. Li, X. Tang, et al. Comparative Study on Theoretical and Machine Learning Methods for Acquiring Compressed Liquid Densities of 1,1,1,2,3,3,3-Heptafluoropropane (R227ea) via Song and Mason Equation, Support Vector Machine and Artificial Neural Networks, *Applied Sciences*, 6.1 (2016): 25.
15. Z. Liu, H. Li, X. Tang, et al. Extreme Learning Machine: A New Alternative for Measuring Heat Collection Rate and Heat Loss Coefficient of Water-in-Glass Evacuated Tube Solar Water Heaters, *SpringerPlus*, 5.1 (2016): 1-8.

CONFERENCE AND WORKSHOP ATTENDANCE/INVITATION

- *"The 17th Annual Meeting of the Operations Research Society of China (OCSC2024),"* Guiyang, Guizhou, China, October, 2024
- *"International Symposium on Mathematical Programming (ISMP24),"* Montreal, Canada, July 2024
- *"2024 International Workshop on Modern Optimization and Applications,"* Beijing, China, June 2024
- *"AIM SQuaREs session,"* Pasadena, CA, April, 2024
- *"POP23 - Future Trends in Polynomial Optimization,"* Toulouse, France, November 2023
- *"The 13th Annual Meeting of Computational Mathematics,"* Nanjing, Jiangsu, China, July 2023
- *"SIAM Conference on Optimization (OP23),"* Seattle, Washington, U.S., May-June 2023
- *"The 14th Mathematical Optimization Symposium (MOS2023),"* Chengdu, Sichuan, China, May, 2023
- *"AIM SQuaREs session,"* San Jose, CA, April, 2023
- *"The 16th Annual Meeting of the Operations Research Society of China (OCSC2023),"* Changsha, Hunan, China, April, 2023
- *"The 2nd Greater Bay Area workshop on Computational Optimization,"* Hong Kong, China, December 10-11, 2021
- *"The International Conference on Polynomial and Tensor Optimization (ICPTO 2018),"* Xiangtan, Hunan, China, December 17-21, 2018
- *The ICERM workshop "Real Algebraic Geometry and Optimization,"* Providence, RI, USA, October 15–19, 2018.

EDITORIAL BOARD SERVICES

- Numerical Algebra, Control and Optimization, 2023-present

REVIEWER OF JOURNALS

Collect. Math, COAP, EJOR, J. Oper. Res. Soc. China, J. Sci. Comput, JOGO, J. Symb. Comput, JOTA, MOR, MP, NACO, Optim. Lett, Pacific J. Optim, SIMAX, SIOPT, ISSAC

TEACHING EXPERIENCES

Hong Kong Baptist University, Hong Kong, China

- Semester 1 2024-25 MATH 1025: Understanding Mathematics and Statistics
- Semester 1 2024-25 MATH 4816 & 7050: Optimization Theory and Techniques
- Semester 2 2023-24 GFQR 1056: Be a Smart Financial Panner
- Semester 1 2023-24 MATH 1025: Understanding Mathematics and Statistics

The Hong Kong Polytechnique University, Hong Kong, China

- Spring 2023 AMA1120: Basic Mathematics II – Calculus and Linear Algebra
- Spring 2022 AMA1120: Basic Mathematics II – Calculus and Linear Algebra

UCSD, San Diego, CA, USA

- Winter 2020 MATH 4C - Pre-calculus for Sci & Engn
- Fall 2019 MATH 20B - Calculus/Science & Engineering
- Spring 2021 MATH 270C – Numerical ODEs (TA)
- Winter 2020 MATH 103B – Modern Algebra II (TA)
- Fall 2020 MATH 103A – Modern Algebra I (TA)
- Summer 2020 MATH 102 - Applied Linear Algebra (TA)
- Spring 2020 MATH 142B - Introduction to Analysis II (TA)
- Summer 2019 MATH 103A - Modern Algebra I (TA)
- Spring 2019 MATH 152 - Applicable Math and Computing (TA)
- Winter 2019 MATH 171A - Intro Num Optimiz/Linear Prog (TA)
- Fall 2018 MATH 245A - Convex Analysis & Optimiz I (TA)
- Fall 2018 MATH 170A - Intro Numerical Analys/Linear (TA)
- Spring 2018 MATH 171B - Intro Num Optimiz/Nonlinear (TA)
- Spring 2018 MATH 20B - Calculus/Science & Engineering (TA)
- Winter 2018 MATH 171A - Intro Num Optimiz/Linear Prog (TA)
- Fall 2017 MATH 18 - Linear Algebra (TA)
- Summer 2017 MATH 110A - Intro/Partial Differ Equations (Reader)

MISCELLANEOUS

- President, Students Association of College of Mathematics, Sichuan University, July 2014-July 2015.
- The Vocal and founding member, Hunkeshui the Band, Dec 2012 – July 2016.