HAIXIANG ZHANG

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Education

August 2019 May 2024	Department of Mathematics, **University of California, Berkeley** Ph.D. Candidate in **Applied Mathematics** Advisor: *Prof. Javad Lavaei*
September 2016 July 2019	School of Electronics Engineering and Computer Science, **Peking University** Bachelor of Science in **Computer Science and Technology**
September 2015 July 2019	School of Mathematical Sciences, **Peking University** Bachelor of Science in **Computational Mathematics** *Elite Undergraduate Program for Applied Mathematics* Advisor: *Prof. Zaiwen Wen*
June 2018 September 2018	Department of Mathematics, **University of California, Los Angeles** Visiting Student in Prof. Wotao Yin's group Advisor: *Prof. Wotao Yin*

Journal Publications

1. "*Stochastic localization methods for convex discrete optimization via simulation*",
   H. Zhang, Z. Zheng, J. Lavaei, *Operations Research*, 2023.
2. "*A new complexity metric for nonconvex rank-one generalized matrix completion*",
   H. Zhang, B. Yalcin, J. Lavaei, S. Sojoudi, *Mathematical Programming*, 2023.
3. "*Gradient-based algorithms for convex discrete optimization via simulation*",
   H. Zhang, Z. Zheng, J. Lavaei, *Operations Research*, 2022.
4. "*Uniqueness of power flow solutions using graph-theoretic notions*",
   H. Zhang, S. Park, J. Lavaei, R. Baldick, *IEEE Transactions on Control of Network Systems*, 2021.
5. "*On the geometric analysis of a quartic-quadratic optimization problem under a spherical constraint*",
   H. Zhang, A. Milzarek, Z. Wen, W. Yin, *Mathematical Programming*, 2021.

Conference Publications (* = Equal Contribution)

1. "*Geometric Analysis of Matrix Sensing over Graphs*",
   H. Zhang, Y. Chen, J. Lavaei, *Conference on Neural Information Processing Systems (NeurIPS)*, 2023.
2. "*Distributionally Robust Optimization for Nonconvex QCQPs with Stochastic Constraints*",
   H. Zhang*, E. Brock*, J. Mulvaney-Kemp, J. Lavaei, S. Sojoudi, *Conference on Decision and Control (CDC)*, 2023.
3. "*Factorization Approach for Low-complexity Matrix Completion Problems: Exponential Number of Spurious Solutions and Failure of Gradient Methods*",

B. Yalcin, **H. Zhang**, J. Lavaei, S. Sojoudi, *25th International Conference on Artificial Intelligence and Statistics (AISTATS)*, 2022.

4. "*Local and global linear convergence of general low-rank matrix recovery problems*",
   Y. Bi, **H. Zhang**, J. Lavaei, *Thirty-Sixth AAAI Conference on Artificial Intelligence*, 2022.
5. "*Stochastic $L^\natural$-convex function minimization*",
   H. Zhang, Z. Zheng, J. Lavaei, *Conference on Neural Information Processing Systems (NeurIPS)*, 2021.
6. "*General low-rank matrix optimization: geometric analysis and sharper bounds*",
   H. Zhang, Y. Bi, J. Lavaei, *Conference on Neural Information Processing Systems (NeurIPS)*, 2021.
7. "*A Dynamical System Perspective for Escaping Sharp Local Minima in Equality Constrained Optimization Problems*",
   H. Feng, **H. Zhang**, J. Lavaei, *Conference on Decision and Control (CDC)*, 2020.

Preprints (* = Equal Contribution)

1. "*Exact Recovery for System Identification with More Corrupt Data than Clean Data*",
   B. Yalcin, **H. Zhang**, J. Lavaei, and M. Arcak, *under review*, 2024.
2. "*Distributionally Robust Joint Chance-Constrained Optimal Power Flow using Relative Entropy*",
   H. Zhang*, E. Brock*, J. Lavaei, S. Sojoudi, *under review*, 2024.
3. "*Selection of the best under convexity*",
   H. Zhang, Z. Zheng, J. Lavaei, *technical report*, 2021.

Invited Talks

March 2024	Computational Mathematics Seminar, *UC Berkeley*, Berkeley, CA, USA
January 2024	Computational Mathematics Seminar, *UC Berkeley*, Berkeley, CA, USA
October 2023	Session on "Structured and Tame Optimization", *INFORMS Annual Meeting*, Phoenix, AZ, USA
June 2023	Session on "Recent Advances in Stochastic Optimization Methods for Machine Learning", *SIAM Optimization Conference*, Seattle, WA, USA
May 2023	Guest lecture at "Numerical algorithms for nonlinear optimization and machine learning" course, *Tsinghua-Berkeley Shenzhen Institute (TBSI)*, Online
October 2022	Session on "Efficient Algorithms for Non-convex Low-rank Matrix Optimization Problems", *INFORMS Annual Meeting*, Indianapolis, IN, USA
September 2022	Seminar of the Elite Program of Comp. and Applied Math for Ph.D. Students, *Peking University*, Beijing, China
October 2021	Session on "Reaching global optimum in non-convex optimization problems", *INFORMS Annual Meeting*, Anaheim, CA, USA
April 2019	Seminar of the Elite Program of Comp. and Applied Math for Ph.D. Students, *Peking University*, Beijing, China
September 2018	The Mathematical Programming Branch of Operation Society of China, *Beihang University (BUAA)*, Beijing, China

Services

Journals	Journal of Machine Learning Research (JMLR), Mathematical Programming, Operations Research, IEEE Trans. on Automatic Control (TAC), IEEE Trans. on Control of Network Systems (TCNS), SIAM Journal on Matrix Analysis and Applications, Probability in the Engineering and Informational Sciences.
Conferences	IEEE Conf. on Decision and Control (CDC), NeurIPS, AISTATS (**Top Reviewer, 10%**), ICML, ICLR, Winter Simulation Conf. (WSC), Conf. on Integer Programming and Combinatorial Optimization (IPCO).
Session Chairs	Session in Optimization Section @ *INFORMS Annual Meeting 2023*. Session in Data Mining Section @ *INFORMS Annual Meeting 2022*.
Teaching	Teaching Assistant for IEOR 173: Intro. to stochastic processes @ *UC Berkeley*.

Awards & Honors

2022	Winner of Two Sigma Ph.D. Fellowship (Top 1)
2022	Top Reviewer for AISTATS (Top 10%)
2019	Excellent Graduate of Peking University
2016, 2017, 2018	Learning Excellence Student
2016, 2017, 2018	May-fourth Scholarship
2017, 2018	Honorable Mention of Mathematical Contest In Modeling
2017	National Innovation Experiment Funding for Undergraduate
2016, 2017	First Prize of Jiangzehan Modeling Contest
2016	First Prize of National Undergraduate Physics Competition
2014	Gold Medal in Chinese Mathematical Olympiad and National Team Selection Camp

Experiences

June 2023 – August 2023
Quantitative Research Intern @ **Two Sigma**

June 2022 – August 2022
Quantitative Research Intern @ **Five Rings**

January 2019 – May 2019
NLP Research Intern @ AI-Lab, **Bytedance Technology**
Mentor: Hang Li (Director of AI-Lab, Bytedance Technology)

- Application of Region Embedding method to sequence labelling tasks, e.g., Named Entity Recognition (NER) and Chinese Word Segmentation (CWS).