JIANHAO MA

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RESEARCH INTERESTS

- **General optimization and generalization in machine learning.**
- **Algorithmic robust statistics.**

EDUCATION

University of Michigan, Ann Arbor *January 2021 - 2025 (expected)*
Department of Industrial and Operational Engineering Ph.D. candidate
Advisor: Prof. Salar Fattahi

Tsinghua University *September 2016 - June 2020*
B.E. in Industrial Engineering and B.S. in mathematics

University of California, Berkeley *January 2019 - August 2019*
Exchange student in the Department of Statistics

EXPERIENCE

IIIS, Tsinghua University *August 2020 - June 2021*
Visiting student, hosted by Prof. Yuhao Wang.

AI Lab, ByteDance *April 2020 - July 2020*
Machine learning engineer intern in deep reinforcement learning.

PREPRINTS AND PUBLICATIONS

1. **Jianhao Ma**, Salar Fattahi, "On the Optimization Landscape of Burer-Monteiro Factorization: When do Global Solutions Correspond to Ground Truth?", submitted for publication, 2023. [link]
2. **Jianhao Ma**, Salar Fattahi, "Global Convergence of Sub-gradient Method for Robust Matrix Recovery: Small Initialization, Noisy Measurements, and Over-parameterization", Journal of Machine Learning Research (JMLR), 2023. [link]
3. **Jianhao Ma**, Lingjun Guo, Salar Fattahi, "Behind the Scenes of Gradient Descent: A Trajectory Analysis via Basis Function Decomposition", International Conference on Learning Representations (ICLR), 2023. [link]
4. **Jianhao Ma**, Salar Fattahi, "Blessing of Nonconvexity in Deep Linear Models: Depth Flattens the Optimization Landscape Around the True Solution", Advances in Neural Information Processing Systems (NeurIPS), 2022 (**Spotlight**). [link]
5. Jiaye Teng*, **Jianhao Ma***, Yang Yuan, "Towards Understanding Generalization via Decomposing Excess Risk Dynamics", International Conference on Learning Representations (ICLR), 2022. [link]
6. **Jianhao Ma**, Salar Fattahi, "Sign-RIP: A Robust Restricted Isometry Property for Low-rank Matrix Recovery", NeurIPS Workshop on Optimization for Machine Learning, 2021. [link]

INVITED TALK/PRESENTATION

1. "Blessing of Nonconvexity in Deep Linear Models: Depth Flattens the Optimization Landscape Around the True Solution". INFORMS Annual Meeting, Indianapolis, IN, October 2022.
2. "Global Convergence of Sub-gradient Method for Robust Matrix Recovery: Small Initialization, Noisy Measurements, and Over-parameterization". INFORMS 2022 Optimization Society Conference, Greenville, SC, March 2022.
3. "Sign-RIP: A Robust Restricted Isometry Property for Low-rank Matrix Recovery". INFORMS Annual Meeting, Anaheim, CA, October 2021.
4. "Sign-RIP: A Robust Restricted Isometry Property for Low-rank Matrix Recovery". MOPTA Conference, Bethlehem, PA, August 2021.

ACTIVITIES/ACADEMIC SERVICE

Organizer
Co-organizer of the session "Recent Advances in Data-Driven Nonconvex Optimization" at INFORMS Annual Meeting, Anaheim, CA, October 2021.

Reviewer
IEEE Transactions on Signal Processing, ICML, NeurIPS, ICLR, AISTATS, NeurIPS Workshop on Optimization for Machine Learning.

PROFESSIONAL SKILLS

Programming Languages Python, MATLAB, R.