

Xiao Mao(毛嘯)

(Last update: August 9, 2025)

Phone: +1 617 955 7652
Email: matthew99a@gmail.com
xiaomao@stanford.edu
Website: matthew99a.github.io

Education

- **Stanford University** *2022 to Present*
Ph.D.
 - Advisor: Aviad Rubinstein
 - Research Area: Theoretical Computer Science
- **Massachusetts Institute of Technology** *2021 to 2022*
M.Eng.
 - Thesis Supervisor: Virginia Vassilevska Williams
- **Massachusetts Institute of Technology** *2017 to 2021*
B.S. in Computer Science and Engineering and in Mathematics

Teaching Experience

- **Design and Analysis of Algorithms** *Fall 2024*
Course Assistant (Instructor: Aviad Rubinstein)
- **Design and Analysis of Algorithms (MIT 6.046J)** *Spring 2022*
Teaching Assistant
(Instructors: Srini Devadas, Vinod Vaikuntanathan, Virginia Vassilevska Williams)

Publications

- [1] Ran Duan, Jiayi Mao, Xiao Mao, Xinkai Shu, and Longhui Yin. Breaking the sorting barrier for directed single-source shortest paths, 2025. URL: <https://arxiv.org/abs/2504.17033>, arXiv:2504.17033.
(STOC 2025 Best Paper) (Invited to the Journal of the ACM)
- [2] Xiao Mao. $(1 - \epsilon)$ -approximation of knapsack in nearly quadratic time. In *Proceedings of the 56th Annual ACM Symposium on Theory of Computing*, STOC 2024, page 295–306, New York, NY, USA, 2024. Association for Computing Machinery. doi:10.1145/3618260.3649677 (In ACM Symposium on Theory of Computing (STOC 2024)).
- [3] Xiao Mao. Fully dynamic all-pairs shortest paths: Likely optimal worst-case update time. In *Proceedings of the 56th Annual ACM Symposium on Theory of Computing*, STOC 2024, page 1141–1152, New York, NY, USA, 2024. Association for Computing Machinery. doi:10.1145/3618260.3649695 (In ACM Symposium on Theory of Computing (STOC 2024)).

- [4] Xiao Mao Mingyang Deng, Ce Jin. Approximating Knapsack and Partition via Dense Subset Sums. In *Proceedings of the 2023 ACM-SIAM Symposium on Discrete Algorithms (SODA)*, 2023.
- [5] Ziqian Zhong Mingyang Deng, Xiao Mao. On Problems Related to Unbounded SubsetSum: A Unified Combinatorial Approach. In *Proceedings of the 2023 ACM-SIAM Symposium on Discrete Algorithms (SODA)*, 2023.
- [6] Xiao Mao. Breaking the Cubic Barrier for (Unweighted) Tree Edit Distance. In *Proceedings of the 62nd IEEE Symposium on Foundations of Computer Science (FOCS)*, 2021.
(Machtey Award for Best Student Paper, sole winner) (Published in the SICOMP Special Issue for FOCS 2021)

Selected Awards and Scholarships

- **STOC 2025** 2025
Best Paper
- **FOCS 2021** 2021
Best Student Paper (Machtey Award, single author, sole winner)
- **45th ICPC World Finals** November 2022
Gold medal, 1st place
- **International Olympiad in Informatics** July to August 2017
Silver medal, 33th place
- **National Olympiad in Informatics, China** July 2016
Gold medal, 1st place

Talks

- **Breaking the sorting barrier for directed single-source shortest paths**
 - Stanford Theory Lunch July 2025
 - Fine-grained Complexity Workshop at EnCORE Institute, UCSD May 2025
 - UCB Theory Lunch May 2025
- **Fully Dynamic All-Pairs Shortest Paths: Likely Optimal Worst-Case Update Time**
 - STOC 2024 June 2024
- **$(1 - \epsilon)$ -Approximation of Knapsack in Nearly Quadratic Time**
 - STOC 2024 June 2024
 - Stanford Theory Lunch June 2023
- **Approximating Knapsack and Partition via Dense Subset Sums**
 - SODA 2023 Jan 2023
- **Breaking the Cubic Barrier for (Unweighted) Tree Edit Distance**
 - FOCS 2021 Feb 2022
 - Yao Class student seminar Sep 2021
 - Theory seminar at the University of Washington Mar 2022

Research and Work Experience

- **Pika (Mellis, Inc.), Palo Alto, CA** *Summer 2025*
Intern
 - AI research intern.
- **Stanford University** *Sep. 2022 to present*
Ph.D. currently advised by Prof. Aviad Rubinstein
 - Focus on algorithms and complexity.
- **Massachusetts Institute of Technology** *Sep. 2021 to Sep. 2022*
M.Eng. with thesis supervised by Prof. Virginia Vassilevska Williams
 - Focus on algorithms and complexity.
- **Massachusetts Institute of Technology** *Feb. 2020 to Dec. 2020*
UROP advised by Professor Michael Sipser
 - Focus on algorithms and complexity.
- **Microsoft Corporation, Bellevue, WA** *Summer 2019*
Intern
 - Software engineer intern.
- **Pony.ai, Inc., Fremont, CA** *Summer 2018*
Intern
 - Software engineer intern.

Service

- Conference Reviewing: ITCS 2022, SWAT 2022, MFCS 2022, SODA 2024, STOC 2024, FOCS 2024, SODA 2025, SOSA 2025, STOC 2025