Xiao Mao(毛啸)

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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

All authors are listed in lexicographic order.

[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

[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

[4] Mingyang Deng, Ce Jin, and Xiao Mao. Approximating Knapsack and Partition via Dense Subset Sums. In *Proceedings of the 2023 ACM-SIAM Symposium on Discrete Algorithms (SODA)*, 2023

[5] Mingyang Deng, Xiao Mao, and Ziqian Zhong. 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, single author, 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, SODA 2026