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

[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] 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, single author, sole winner) (Published in the SICOMP Special Issue for FOCS 2021)

Selected Awards and Scholarships

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

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**
  Intern
  Summer 2025
  - AI research intern.

- **Stanford University**
  Ph.D. currently advised by Prof. Aviad Rubinstein
  Sep. 2022 to present
  - Focus on algorithms and complexity.

- **Massachusetts Institute of Technology**
  M.Eng. with thesis supervised by Prof. Virginia Vassilevska Williams
  Sep. 2021 to Sep. 2022
  - Focus on algorithms and complexity.

- **Massachusetts Institute of Technology**
  UROP advised by Professor Michael Sipser
  Feb. 2020 to Dec. 2020
  - Focus on algorithms and complexity.

- **Microsoft Corporation, Bellevue, WA**
  Intern
  Summer 2019
  - Software engineer intern.

- **Pony.ai, Inc., Fremont, CA**
  Intern
  Summer 2018
  - Software engineer intern.

Service

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