Lichen Zhang

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Education

Massachusetts Institute of Technology — Sep 2022 - May 2027 (expected)
Ph.D in Applied Mathematics, Advisor: Jonathan Kelner — *Cambridge, MA*

Carnegie Mellon University — June 2021 – May 2022
M.S. in Computer Science, Advisor: Gary Miller — *Pittsburgh, PA*

Carnegie Mellon University — Aug 2017 – May 2021
B.S. in Computer Science — *Pittsburgh, PA*

Research Interests

- Sketching, sampling and streaming.
- Differential privacy.
- Optimization.

Publications (Author names in alphabetical order)

Low Rank Matrix Completion via Robust Alternating Minimization in Nearly Linear Time
- Yuzhou Gu, Zhao Song, Junze Yin and **Lichen Zhang**
- To appear in the 12th International Conference on Learning Representations (ICLR 2024)
- arxiv link: https://arxiv.org/pdf/2302.11068.pdf

Training Multi-Layer Over-Parametrized Neural Network in Subquadratic Time
- Zhao Song, **Lichen Zhang** and Ruizhe Zhang
- To appear in the 15th Innovations in Theoretical Computer Science (ITCS 2024)
- arxiv link: https://arxiv.org/pdf/2112.07628.pdf

Convex Minimization with Integer Minima in $\widetilde{O}(n^4)$ Time
- Haotian Jiang, Yin Tat Lee, Zhao Song and **Lichen Zhang**
- Published in the 35th Annual ACM-SIAM Symposium on Discrete Algorithms (SODA 2024)
- arxiv link: https://arxiv.org/pdf/2304.03426.pdf

Sketching Meets Differential Privacy: Fast Algorithm for Dynamic Kronecker Projection Maintenance
- Zhao Song, Xin Yang, Yuanyuan Yang and **Lichen Zhang**
- Published in the 40th International Conference on Machine Learning (ICML 2023)
- arxiv link: https://arxiv.org/pdf/2210.11542.pdf

Sketching for First Order Method: Efficient Algorithm for Low-Bandwidth Channel and Vulnerability
- Zhao Song, Yitan Wang, Zheng Yu and **Lichen Zhang**
- Published in the 40th International Conference on Machine Learning (ICML 2023)
- arxiv link: https://arxiv.org/pdf/2210.08371.pdf

A Nearly-Optimal Bound for Fast Regression with ℓ_∞ Guarantee
- Zhao Song, Mingquan Ye, Junze Yin and **Lichen Zhang**
- Published in the 40th International Conference on Machine Learning (ICML 2023)

Space-Efficient Interior Point Method, with applications to Linear Programming and Maximum Weight Bipartite Matching
- S. Cliff Liu, Zhao Song, Hengjie Zhang, **Lichen Zhang** and Tianyi Zhou
- Published in the 50th International Colloquium on Automata, Languages and Programming (ICALP 2023)
- arxiv link: https://arxiv.org/pdf/2009.06106.pdf

An Online and Unified Algorithm for Projection Matrix Vector Multiplication with Application to Empirical Risk Minimization
- Lianke Qin, Zhao Song, **Lichen Zhang** and Danyang Zhuo
- Published in the 26th International Conference on Artificial Intelligence and Statistics (AISTATS 2023)

- link: https://proceedings.mlr.press/v206/qin23a/qin23a.pdf

Dynamic Tensor Product Regression

- Aravind Reddy, Zhao Song and **Lichen Zhang**
- Published in the 36th Conference on Neural Information Processing Systems (NeurIPS 2022)
- arxiv link: https://arxiv.org/pdf/2210.03961.pdf

Fast Sketching of Polynomial Kernels of Polynomial Degree

- Zhao Song, David P. Woodruff, Zheng Yu, and **Lichen Zhang**
- Published in the 38th International Conference on Machine Learning (ICML 2021).
- arxiv link: https://arxiv.org/pdf/2108.09420.pdf

Teaching

CMU 15-155 The Computational Lens Jan 2022 – May 2022

- Instructor: Professor Pravesh Kothari and Professor Anil Ada

CMU 15-455 Undergraduate Complexity Theory Jan 2021 – May 2021

- Instructor: Professor Pravesh Kothari

Experience

Visiting Student at Simons Institute for the Theory of Computing Aug 2023 – Dec 2023

- Data Structures and Optimization for Fast Algorithms program
- Host: Zhao Song

Research Scientist Intern at Adobe Inc. (Adobe Research) May 2023 – Aug 2023

- Mentor: Ritwik Sinha, Zhao Song, Raghavendra Addanki

Research Assistant at University of Washington Jun 2022 – Aug 2022

- Advisor: Yin Tat Lee

Undergraduate Research Assistant at Carnegie Mellon University May 2020 – Aug 2020

- Advisor: Gary Miller
- Supported by CMU Summer Undergradate Research Fellowship (SURF).

Services

External Reviewer

- ICML 2024, AISTATS 2024, ICLR 2024, NeurIPS 2023, AISTATS 2023, SODA 2023

Awards & Honors

MIT Reitano Fellowship Sep 2022 – Aug 2023

CMU Summer Undergraduate Research Fellowship May 2020 – Aug 2020