Lichen Zhang

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Education

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

Carnegie Mellon University June 2021 – May 2022
M.S. in Computer Science, Advisor: Gary L. 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.
- Federated learning.

Experience

Teaching Assistant (Instructor: Pravesh K. Kothari and Anil Ada) Jan 2022 – May 2022
Carnegie Mellon University *Pittsburgh, PA*
- Teaching Assistant for The Computational Lens (15-155) class.

Teaching Assistant (Instructor: Pravesh K. Kothari) Jan 2021 – May 2021
Carnegie Mellon University *Pittsburgh, PA*
- Teaching Assistant for Undergraduate Complexity Theory (15-455) class.

Undergraduate Research Assistant (Advisor: Gary L. Miller) Oct. 2019 – Sep. 2020
Carnegie Mellon University *Pittsburgh, PA*
- Granted under CMU Summer Undergraduate Research Fellowship (SURF).
- Discrete optimization algorithm via ODE perspective.
- Combinatorial graph clustering algorithm breaks Cheeger's bound.

Publications (Author names in alphabetical order)

Dynamic Tensor Product Regression
- Aravind Reddy, Zhao Song and **Lichen Zhang**
- To appear in thirty-sixth Conference on Neural Information Processing Systems (NeurIPS 2022)
- arxiv link: https://arxiv.org/pdf/2210.03961.pdf

Sketching Meets Differential Privacy: Fast Algorithm for Dynamic Kronecker Projection Maintenance
- Zhao Song, Xin Yang, Yuanyuan Yang and **Lichen Zhang**
- 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**
- arxiv link: https://arxiv.org/pdf/2210.08371.pdf

Training Multi-layer Over-parametrized Neural Networks in Subquadratic Time
- Zhao Song, **Lichen Zhang** and Ruizhe Zhang
- arxiv link: https://arxiv.org/pdf/2112.07628.pdf

Fast Sketching of Polynomial Kernels of Polynomial Degree
- Zhao Song, David P. Woodruff, Zheng Yu, and **Lichen Zhang**
- Published in the thirty-eighth International Conference on Machine Learning (ICML 2021).
- arxiv link: https://arxiv.org/pdf/2108.09420.pdf

Programming Experience

Fast Sketching of Polynomial Kernels of Polynomial Degree Jan. 2021

- Implemented the developed algorithm in the paper for numerical experiments using numpy.
- Achieved the state-of-the-art performance for three public datasets: DrivFace, RNASeq and Gait.

CMU 10-701 Course Project Nov. 2019

- Implemented pre-trained BERT (state-of-the-art at that time) for predicting yelp scores.
- Model achieved $> 70\%$ accuracy rate.

CMU 15-213 Dynamic Memory Allocation July 2018

- Implemented dynamic memory allocation algorithm in language C.
- Achieved 23239 kops and 74.3% utility.
- Ranked No. 1 in the class of 51 students.

References

Gary L. Miller, Professor at Carnegie Mellon University Email: gm2f@andrew.cmu.edu

Zhao Song, Researcher at Adobe Research Email: zsong@adobe.com

Pravesh K. Kothari, Assistant Professor at Cargenie Mellon University Email: sawako@cs.cmu.edu