Ziqian Zhong

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Education

Ph.D. in Computer Science, Carnegie Mellon University *01/2025 – present*

Conduct research around AI interpretability and safety to better understand and align AI systems. Advised by Aditi Raghunathan.

B.S. in Computer Science & Mathematics, Massachusetts Institute of Technology *08/2020 – 06/2024*

GPA: 5.0/5.0. Selected Coursework: Quantitative Methods for NLP; Multi-agent Communication; Machine Learning; Advanced Complexity Theory; Fundamentals of Statistics.

Experiences

Research Scientist, Pika Labs / Mellis Inc. *06/2024 – 01/2025*

Developed and improved large-scale video generation models. Contributed to Pika 1.5 and led the release of Pika 2.0.

Deep Learning Undergraduate Researcher, MIT *08/2022 – 06/2024*

Worked on interpreting and understanding neural networks with Neil Thompson, Jacob Andreas, and Ziming Liu.

Theoretical Computer Science Undergraduate Researcher, MIT *10/2021 – 05/2022*

Member of research team guided by Virginia Vassilevska Williams. Co-discovered new results in graph theory and combinatorics, leading to several publications.

Algo Developer Intern, Hudson River Trading *05/2023 – 08/2023*

Conducted market and algorithmic research; project featured in intern spotlights.

Talks

- **Two Stories in Mechanistic Explanation of Neural Networks**. NeurIPS 2023 Oral with Ziming Liu.
- **New Approach for Unbounded SubsetSum**. SODA 2023.

Publications

- **The Clock and the Pizza: Two Stories in Mechanistic Explanation of Neural Networks**. Ziqian Zhong*, Ziming Liu*, Max Tegmark, Jacob Andreas. Oral, NeurIPS 2023.
- **Algorithmic Capabilities of Random Transformers**. Ziqian Zhong, Jacob Andreas. NeurIPS 2024.
- **On Problems Related to Unbounded SubsetSum: A Unified Combinatorial Approach**. Mingyang Deng*, Xiao Mao*, Ziqian Zhong*. SODA 2023
- **Grokking as Compression: A Nonlinear Complexity Perspective**. Ziming Liu, Ziqian Zhong, Max Tegmark. NeurIPS 2023 UniReps Workshop.
- **New Additive Approximations for Shortest Paths and Cycles**. Mingyang Deng*, Yael Kirkpatrick*, Victor Rong*, Virginia Vassilevska Williams*, Ziqian Zhong*. ICALP 2022.
- **New Lower Bounds and Upper Bounds for Listing Avoidable Vertices**. Mingyang Deng*, Virginia Vassilevska Williams*, Ziqian Zhong*. MFCS 2022.

Selected Awards

- Gold Medal, 4th Place – International Olympiad in Informatics 2019
- First Place – Meta Hackercup 2024
- Gold Medal – 46th ICPC World Final
- Honorable Mention – Alibaba Global Mathematics Competition 2022
- Honorable Mention – Putnam Mathematical Competition 2022

Selected Projects

- **Is my problem new?** (Link, 11/2023). Employ LLMs and vector embeddings to detect similarity among competitive programming problems. ∼20k monthly page views and adopted by major contest setters.
- **CP Ideas** (Link, 07/2022). Generates competitive programming problems via fine-tuned GPT-3. Dataset collected and cleaned from various online judges.
- **Understanding Transformer Sorting** (Link, 01/2023, with Benjamin Qi). Performed mechanistic interpretability to understand mechanisms in sorting transformers. Work done as part of the 2023 CBAI Winter ML Bootcamp.