Ziqian Zhong

✉ ziqianz@mit.edu   📞 8572428372   ⚑ fjzzq2002.github.io

Research Interests

I'm interested in understanding and improving language models. My current research aims to gain better understanding of mechanisms and limitations of large language models, in order to align or improve them.

Education

Candidate for B.S. in Computer Science and Mathematics   2020/08 – present
Massachusetts Institute of Technology   Cambridge, MA
GPA: 5.0/5.0
Selected Coursework: Quantitative Methods for Natural Language Processing (A), Machine Learning (A), Fundamentals of Statistics (A), Advanced Data Structure (A+), Advanced Complexity Theory (A), Combinatorial Theory (A), Number Theory I (A), Computation Structures (A+), Elements of Software Construction (A+)

Experiences

Deep Learning Research @ MIT   2022/11 – present
Supervised by Jacob Andreas, Max Tegmark   Cambridge, MA
Focused on interpreting and understanding neural networks. Result in published papers.

Deep Learning Research @ MIT   2022/08 – 2023/06
Supervised by Neil Thompson   Cambridge, MA
Conducted research to unveil connections between various properties of functions and learning dynamics. Responsible for developing training pipelines and collecting data.

Theoretical Computer Science Research @ MIT   2021/10 – 2022/05
Supervised by Virginia Vassilevska Williams   Cambridge, MA
Discovered and published several new results in graph theory and combinatorics.

Algo Developer Intern   2023/05 – 2023/08
Hudson River Trading   New York, NY
Conducted both market and algorithmic research. Project featured in intern spotlights ⬈ .

Publications

First authors marked with *. Theoretical CS papers have authors ordered alphabetically.

The Clock and the Pizza: Two Stories in Mechanistic Explanation of Neural Networks ⬈   2023/06
Ziqian Zhong, Ziming Liu*, Max Tegmark, Jacob Andreas*; NeurIPS 2023 (*Oral*)

Grokking as Compression: A Nonlinear Complexity Perspective ⬈   2023/10
Ziming Liu, Ziqian Zhong*, Max Tegmark*; NeurIPS 2023 NeurReps Workshop

On Problems Related to Unbounded SubsetSum: A Unified Combinatorial Approach ⌐
2023/01

Mingyang Deng, Xiao Mao, Ziqian Zhong; SODA 2023

New Lower Bounds and Upper Bounds for Listing Avoidable Vertices ⌐
2022/08

Mingyang Deng, Virginia Vassilevska Williams, Ziqian Zhong; MFCS 2022

New Additive Approximations for Shortest Paths and Cycles ⌐
2022/07

Mingyang Deng, Yael Kirkpatrick, Victor Rong, Virginia Vassilevska Williams, Ziqian Zhong; ICALP 2022

Talks

New Approach for Unbounded SubsetSum
2023/01

SODA 2023
Florence, Italy

Selected Awards

Gold Medal, Fourth Place
2019/08

International Olympiad in Informatics 2019
The most prestigious computer science olympiad for secondary school students. Gold medal and 4th place overall as a member of the China team.

Fourth Place
2023/12

Meta Hacker Cup 2023
International competitive programming contest. Fourth place out of 12k+ participants.

First Place
2022/05

ICPC North America Championship 2022
ICPC is an algorithmic programming contest for college students. As a member of the MIT ICPC team, secured first place by a large margin among top teams from 50 schools.

Honorable Mention
2022/06

Alibaba Global Mathematics Competition 2022
Ranked top 100 in the international mathematics competition with 50k+ participants.

Honorable Mention
2022/12

Putnam Mathematical Competition 2022
Ranked top 100 in the preeminent undergraduate mathematics competition.

Second Place
2022/01

Weblab 2022
Annual one-month web development hackathon in MIT. Second place among 120 teams.

Selected Projects

CP Ideas ⌐
2022/07

https://fjzzq2002.github.io/cpideas/
A tool that generates competitive programming problems by fine-tuning GPT-3. Collected and cleaned data scrapped from various online judges.