

Zhaienhe ZHOU

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🏠 Zhaienhe Zhou

Education

- 2022.9 – **University of Science and Technology of China (USTC)**, Hefei
2026.7 Bachelor of Engineering in Computer Science
(expected) **School of the Gifted Young**, Advisor: Xue Chen
Grade GPA(overall): **3.74/4.3**, Score: **88.68**
Selected awards
 - Highest Honor, 13th place in **ICPC World Finals** (top 1%)
 - Gold Medal, 10th place in **ICPC Asia-East Continent Final** (top 1%)
 - Gold Medal, 2nd place in ICPC Nanjing Regional (top 1%)
 - Bronze Medal, National Olympiad in InformaticsSelected courses
 - Foundations of Algorithms (100/100), Combinatorics (98/100), Data Structure (97/100), Computer Programming (H) (97/100), Linear Algebra (90/100), Operations Research (90/100), Probability Theory (90/100), Compiler Principles (90/100), Graph Theory (88/100), Computational Method (87/100), Graduate Optimization Algorithms (taking)

Publications

- **Zhaienhe Zhou** and Zeyu Guo. *Improved Decoding of Tanner Codes*. 2025 IEEE International Symposium on Information Theory (ISIT 2025), to appear. [arXiv:2501.12293]

In Submission

- Xue Chen, Wenxuan Shu and **Zhaienhe Zhou**. *Algorithms for Sparse LPN and LSPN Against Low-Noise*. Manuscript, submitted to COLT (authors listed alphabetically). [arXiv:2407.19215]

Research Experiences

- 2024.8 **Improved Decoding of Tanner Codes**, *Research Assistant*
Advisor: Zeyu Guo (Assistant Professor, Department of Computer Science and Engineering, Ohio State University)
 - Improved previous message passing algorithm via weighted voting, extending the decoding regime from $\delta d_0 > 3$ to $\delta d_0 > 2$.
 - Enhanced the deterministic decoding radius to αN .
 - Derived tighter upper bounds for the distance of Tanner codes using the size-expansion tradeoff.
 - Studied foundational works and recent advancements in Expander, Tanner, and Ins-del codes.

2024.2 – **Algorithms for Sparse LPN and LSPN Against Low-noise**, *Research Assistant*
present Advisor: Xue Chen (Research Professor, Department of Computer Science, USTC)
 - Present a LSPN algorithm that runs in time $O(\eta \cdot n/k)^k$. Improving the state-of-the-art for LSPN in a wide range of parameters.
 - Presented a learning algorithm for sparse LPN with time complexity $e^{\tilde{O}(\eta \cdot n^{\frac{1+\delta}{2}})}$ and sample complexity $m = n^{O(1) + (\frac{k}{2})(1-\delta)}$.
 - Our approach is based first on domain reduction using the knowledge of sparsity, followed by Gaussian elimination or BKW.
 - Investigated previous LSPN and Sparse LPN algorithms.

2023.9 – **Expansion on Regular Graph**, *Research Assistant*
2024.1 Advisor: Xue Chen (Research Professor, Department of Computer Science, USTC)
 - Investigated lower bounds on graph expansion using the second eigenvalue and girth methods.
 - Explored enhancements to the girth method for stronger expansion bounds.

Other Experience

- 2024.7 **"Beauty of Computational Theory" Summer School**, *Student*, hosted by Nanjing University
- Learned about topics like boolean function analysis, MCMC, random walk, differential privacy, etc.
 - Excelled in the final exam, earning direct access to the graduate program interview.
- 2024.7 **Video Encoding and Decoding Algorithm**, *Intern*
- Advisor: Chaoyi Han (one of *Huawei TopMinds*, Multimedia group, Huawei)
- Studied H.265 standards and implementation, read x265 source code, wrote documentation, and summarized the rate control algorithms in ABR & CRF modes.
 - Investigated JND-related papers, replicated the experiments, and analyzed the results.

Teaching Experiences

- 2024.2 – **Teaching Assistant**, Foundations of Algorithms, USTC
- 2024.6 Designed lab assignments and conducted weekly office hours.
- 2024.1 – **Competition Coach**, TopsCoding, Winter 2024 Course
- 2024.2 Presented tutorials on string algorithms and number theory.

Awards

Competitive Programming

- 2024 Gold Medal, 10th place, ICPC Asia-East Continent Final
- 2024 Gold Medal, 2nd place, ICPC Nanjing Regional
- 2024 Gold Medal, 2nd place, CCPC Harbin Regional
- 2024 Highest Honor, 13th place, ICPC World Finals Astana (solved the same number of problems as the 12th place bronze medal team)
- 2024 Gold Medal, 14th place, ICPC Asia-East Continent Final
- 2023 Gold Medal, 6th place in ICPC Hangzhou Regional, 6th place in ICPC Xian Regional
- 2023 Gold Medal, 28th place, ICPC Asia-East Continent Final
- 2022, 2023 Gold Medal, 8th place in ICPC Xian Regional, 27th place in ICPC Shenyang Regional
- 2021 Bronze Medal, National Olympiad of Informatics of China
- 2020, 2021 First Prize, National Olympiad of Informatics in Provinces (Beijing)
- 2020 Silver Medal, Asia-Pacific Informatics Olympiad, China region

Math

- 2023 Second Prize, National College Student Mathematics Competition

Scholarships

- 2023, 2024 Silver Scholarship (top 10%), School of the Gifted Young, USTC
- 2022 Talent Program Scholarship, Talent Program in Computer Science (Hua Xia)
- 2022 Admission Scholarship, School of the Gifted Young, USTC

Activities

- 2022 – 2024 **Vice President**, Computer Programming Club, USTC.
- 2022 – 2024 **Member**, Publicity Department, Student Union of the School of the Gifted Young, USTC.
- 2023 **Top 19/300**, Short-distance (10 km) Marathon, USTC.

Skills

- Language English (fluent, TOEFL: 102, GRE: Q170+V152+3), Chinese (native)
- Programming C/C++, Python, Verilog, Javascript, \LaTeX
- Software Mathematica