Shengtang Huang (黄盛唐)

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Education

University of Science and Technology of China (USTC), Hefei, China *Aug. 2022 ∼ Present*

- Bachelor of Computer Science and Technology *currently a senior student*
- School of the Gifted Young *supervised by Prof. Xue Chen*
- **Overall GPA: 3.88/4.30, top 5%** **Major GPA: 4.01/4.30**
- **Core Courses:**
  Computer Science: Foundations of Algorithms (100), Computer Programming (H) (99), Data Structures (97), Computer Organization (95), Computer Networks (94).
  Mathematics: Linear Algebra I & II (90, 92), Advanced Combinatorics (100), Probability Theory & Its Outer Chapter (100, 100), Advanced Probability Theory *(100), Graph Theory *(92), Regression Analysis (97), Operations Research (96), Optimization Algorithm *(92).
  Note: (H) represents the curriculum of Honors. * indicates that this course is a graduate-level course.

Publications & Manuscripts

Following the convention in theoretical computer science, unless stated otherwise, author names are ordered alphabetically.

1. **Range Avoidance and Remote Point: New Algorithms and Hardness**
   Shengtang Huang, Xin Li, Yan Zhong
   In the 17th Innovations in Theoretical Computer Science Conference, **ITCS 2026**

2. **Explicit Min-wise Hash Families with Optimal Size**
   Xue Chen, Shengtang Huang, Xin Li
   In the 37th Annual ACM-SIAM Symposium on Discrete Algorithms, **SODA 2026**

Research Experiences

Derandomization of load balancing based on linear hashing
Advisors: Xue Chen, USTC; Xin Li, JHU; Fernando Granha Jeronimo, UIUC *Jul. 2025 ∼ Present*

- Tried to find an explicit linear hash family with small size that has nice load balancing properties.

Construction of pseudorandom code against insertion-deletion error
Advisor: Xin Li, JHU *Oct. 2025 ∼ Present*

- Tried to construct a pseudorandom code (PRC) against insertion-deletion error. Previous results only construct PRCs against substitution error.

New algorithms and hardness for range avoidance and remote point problems
Advisor: Xin Li, JHU *Jul. 2025 ∼ Sept. 2025*

- Proved the equivalence between the existence of $\mathbf{FP}^{\mathbf{NP}}$ algorithms for $\mathcal{C}$-Avoid$[n, n^{1+\varepsilon}]$ problem and $2^{\Omega(n)}$ lower bounds against $\mathcal{C}$ circuits for the class $\mathbf{E}^{\mathbf{NP}}$, for some suitable circuit class $\mathcal{C}$.

- Showed the equivalence between the existence of $\mathbf{FP}^{\mathbf{NP}}$ algorithms for general RemotePoint problem and $2^{\Omega(n)}$ average-case lower bounds against general circuits for the class $\mathbf{E}^{\mathbf{NP}}$.
- Designed a fast graph-based algorithm for $\mathbf{NC}^0_k$-Avoid$[n, n^{1+\varepsilon}]$, with time complexity $2^{n^{1-\frac{\varepsilon}{k-1}+o(1)}}$.
- Found a greedy algorithm for $\mathbf{NC}^0_k$-Avoid$[n, n+1]$, with time complexity $O(n2^{\frac{k-1}{k-2}n})$.
- The paper has been accepted by **ITCS 2026**.

Construction of the min-wise hash family with short seed length and small multiplicative error
Advisors: Xue Chen, USTC; Xin Li, Johns Hopkins University *Sept. 2024 ∼ Apr. 2025*

- Found the connection between the min-wise hash family and pseudorandomness generator of combinatorial rectangles.
- Constructed an explicit min-wise hash family $\mathcal{H} = \{h : [N] \to [\text{poly}(N)]\}$ with seed length $O(\log N)$ and multiplicative error $2^{-O\left(\frac{\log N}{\log\log N}\right)}$.
- Designed an explicit k-min-wise hash family $\mathcal{H} = \{h : [N] \to [\text{poly}(N)]\}$ with seed length $O(k \log N)$ and multiplicative error $2^{-O\left(\frac{\log N}{\log\log N}\right)}$.
- The paper has been accepted by **SODA 2026**.

A fast algorithm for $(1+\varepsilon)$-approximate incremental matching problem on general graphs
Advisor: Slobodan Mitrović, UCD *Jul. 2024 ∼ Aug. 2024*

- Extended the method of solving $(1+\varepsilon)$-approximate incremental matching problem from bipartite graphs to general graphs.
- Achieved the amortized complexity $\exp(1/\varepsilon)$ for $(1+\varepsilon)$-approximate incremental matching problem.
- Attended the workshop WoLA at Simons Institute for the Theory of Computing, University of California, Berkeley, with Prof. Slobodan Mitrović and Dr. Wen-Horng Sheu.

Teachings

Teaching Assistant *USTC, Hefei, China*

- Operations Research (2024 Fall) *Lecturer: Prof. Shixiang Chen*
- Foundations of Algorithms (2024 Spring) *Lecturer: Prof. Xue Chen*

Honors & Awards

- **Merit Award** in S.-T. Yau College Student Mathematics Contests 2025, **ranked 32nd** in Probability and Statistics track. The contest's difficulty is comparable to qualifying exams for Ph.D. programs at top U.S. universities.
- **Gold Prize for Outstanding Student Scholarship:** Awarded in Oct. 2025, this university-level scholarship is granted to the top 3% of outstanding students at USTC.
- **Qiangwei Yuanzhi Scholarship:** Awarded in Oct. 2024, this university-level scholarship is granted to the top 5% of outstanding students at USTC.
- **Sliver Awards** in the 2024 ICPC East Asia Shanghai Regional Contest and the 2023 ICPC East Asia Shenyang Regional Contest.
- **First Prize** in National Olympiad in Informatics in Provinces in 2020 and 2021.

Skills

- **Programming:** C, C++, Python, Matlab, R, Verilog.
- **Software:** Git, LaTeX, Microsoft Office.
- **Languages:** English (fluent), Chinese (native).

References

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