Benyu Wang

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Interests

◦ Broad interest in **Theoretical Computer Science**.
◦ Study and research experience in **Graph Algorithms** / **Combinatorics** / **Complexity Theory**

Education

Yao Class, Tsinghua University **Beijing, China**
B.Eng. Candidate, Computer Science and Technology Aug 2019 – (exp.) Jun 2023
◦ **Special CS Pilot Class**, established by the Turing Award Laureate, **Prof. Andrew Yao**.
◦ GPA: **3.90**/4.00 & For Yao Class courses only: **3.98**/4.00
◦ Advisor: *Prof. Ran Duan*

Selected Courses: (A+/A stand for 95-100 in 100-point values, A+ is the best grade)
· Mathematics for Computer Science (**A+**) & Mathematics for Artificial Intelligence (**A+**)
The only one to get both A+ from the two courses instructed by **Prof. Andrew Yao** in Spring 2020.
· Theory of Computation (**A+**) & Design and Analysis of Algorithms (**A+**)
· Basic Topology (A) & Abstract Algebra (A+) & Game Theory (A) & Cryptography (A)

Experiences

University of Michigan **Ann Arbor, USA**
Undergraduate Research Intern (Visitor) Feb 2022 – Aug 2022
◦ Visiting the theory group of UM. invited by *Prof. Seth Pettie*.

Publications

Tight Conditional Lower Bounds for Vertex Connectivity Problems
Zhiyi Huang, Yaowei Long, Thatchaphol Saranurak, **Benyu Wang**
◦ Manuscript, submitted to STOC 2023. arXiv:2212.00359.
◦ We give **tight lower bounds** for vertex connectivity problems assuming the 4-Clique conjecture. We show that the all-pairs vertex connectivity problem has complexity $\hat{\Theta}(n^4)$ for combinatorial algorithms. We give hardness results for other vertex connectivity problems, which separates the hardness of vertex connectivity problems and related edge connectivity problems. We also obtain lower bounds and algorithms for sparse graphs.
◦ In this project, I completed the final construction of reductions for all-pairs and Steiner vertex connectivity problems, and the balancing algorithm for sparse graphs with the guidance of Thatchaphol.

Teaching

Teaching Assistant, Theory of Computation Spring 2023, Tsinghua University
Undergraduate theory course instructed by Prof. Ran Duan. **Teaching Assistant**, Design and Analysis of Algorithms Fall 2022, Tsinghua University
Graduate-Level algorithm course instructed by Prof. Ran Duan.

Selected Awards and Scholarships

Excellent Academic Scholarship & **Excellent Art** Scholarship of Tsinghua University 2022
Excellent Voluntary and Public Service Scholarship of Tsinghua University 2020
Gold Medal in Chinese Mathematical Olympiad (CMO) (ranked **86th** in China) 2018
Silver Medal in National Olympiad in Informatics (NOI) (ranked **90th** in China) 2018