

Zihan Hu

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EDUCATION

- **Tsinghua University** Beijing, China
Bachelor in Computer Science *Aug. 2019 - July 2023 (Expected)*
 - Yao Class, Institute for Interdisciplinary Information Sciences (IIIS), led by Prof. Andrew Yao.
 - GPA: **3.97/4.00**; Rank: **2/94**.
 - TOEFL: 106 (Speaking: 25); GRE: 331 (Verbal: 161).
 - Focus on theoretical computer science, including cryptography, quantum computing, complexity and algorithm.

RESEARCH EXPERIENCE

- **Hardness of Public-Key Quantum Money** University of California, Santa Barbara (Remote)
Mentors: Prof. Prabhanjan Ananth and Prof. Henry Yuen *Jan. 2022 - Sep. 2022*
 - Public-key quantum money is a protocol that utilizes the non-cloning principle of quantum mechanics to make banknotes that are publicly verifiable yet resistant to counterfeiting. However, constructing provably secure public-key quantum money schemes, or even just proposing candidate schemes, remains challenging.
 - We ruled out the class of black-box constructions from collision-resistant hash functions to public-key quantum money schemes where the verification algorithm only makes classical queries to the hash functions.
 - Our paper was submitted to QIP and STOC. My contribution in this project includes discussion, deriving and writing the formal proof, and proofreading.
- **Subexponential Attack on Lattice Problems** Tsinghua University
Mentor: Prof. Yilei Chen *Feb. 2021 - Nov. 2021*
 - Assumptions on the hardness of lattice problems are the underlying computational assumptions for a wide range of cryptographic protocols. While the existence of worst-case to average-case reduction makes lattice problems considered resistant to classical attacks, their hardness in quantum setting has not been well studied.
 - Following the ideas of reductions between lattice problems, we attempted to figure out whether quantum computing could provide a more efficient solution for lattice problems.
 - Collaborate with Yilei Chen, Qipeng Liu and Yaxin Tu.

PROJECTS

- **On the (Im)plausibility of Public-Key Quantum Money from Collision-Resistant Hash Functions**
Prabhanjan Ananth, Zihan Hu, Henry Yuen *In Submission*

HONORS AND AWARDS

- **Yao Award, Recognition Prize** | Institute for Interdisciplinary Information Sciences *2022*
- **Comprehensive Excellence Scholarship** | Tsinghua University *2021*
- **Academic Excellence Scholarship** | Tsinghua University *2020*
- **Sports Excellence Scholarship** | Tsinghua University *2020*
- **Chinese Mathematical Olympiad, Silver Medal** | Chinese Mathematical Society *2018*
- **Chinese Girls' Mathematical Olympiad, Gold Medal** | Chinese Mathematical Society *2018*

STUDENT ACTIVITIES

- Class Leader | Yao Class 91, Tsinghua University *Sep. 2020 - Sep. 2021*
- Keen on a variety of sports, especially middle-distance and long-distance running.
 - Placed 3rd in the Women's 800m and 4th in Women's 1500m in annual sport meet on campus.
 - Top 30 in Tsinghua University Mini Marathon (4.2 km) and Campus Marathon (10 km) among thousands of female participants.