Zihan Hao

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Education

- **Tsinghua University** — Beijing, China
  Bachelor of Engineering in Computer Science - IIIS (Yao Class) — *Aug. 2020 - (Expected) July 2024*
  - GPA: 3.86/4.00 (Major GPA: 3.93/4.0)

Publications and Preprints

- **[1]** Zhenhuan Liu, **Zihan Hao**, Hong-Ye Hu: **Predicting Arbitrary State Properties from Single Hamiltonian Quench Dynamics**, *Physical Review Letters in submission*, arXiv preprint arXiv:2311.00695

- **[2]**= Fangqi Dong, **Zihan Hao**, Ethan Mook, Daniel Wichs: **Laconic Function Evaluation, Functional Encryption and Obfuscation for RAMs with Sublinear Computation**, *accepted by Eurocrypt2024*, ePrint:2024/068

=: authors are alphabetically-ordered.

Research Experience

- **Tomography** — *Tsinghua University, Beijing*
  Supervised by Prof. Xiongfeng Ma

  Predicting State Properties from Single Hamiltonian Dynamics [1] — Sep. 2023 - Nov. 2023
  - Topic: Randomized Measurement, Tomography
  - Proposed the *Hamiltonian Shadow* protocol, which extracts complete information of the target system, using only a single Hamiltonian evolution without any ancillary systems.
  - Derived sample complexity of our protocol and showed comparable performance to the classical shadow method.

- **Laconic Function Evaluation** — *Northeastern University, MA*
  Supervised by Prof. Daniel Wichs

  Laconic Function Evaluation for RAMs from (Ring-)LWE — July 2023 - present
  - Topic: Laconic Function Evaluation, RAM Circuit
  - Developed a RAM-LFE primitive based on (Ring-)LWE assumption and provided proof.
  - Showed that our method can be generally adapted to obtain a variety of other primitives.

  Laconic Function Evaluation for RAMs [2] — Mar. 2023 - June 2023
  - Topic: Laconic Function Evaluation, RAM Program
  - Introduced the primitive of Laconic Function Evaluation for the RAM computation model (RAM-LFE), where a client delegates a RAM program to a server, asking it to run on a large database and return the output.
  - Developed two different form of the RAM-LFE primitive and presented proofs, based on Ring-LWE assumption and indistinguishability obfuscation(iO) respectively.

Honors and Awards

Academic Excellence Award, Tsinghua University	Oct. 2023
Athletic Excellence Award, Tsinghua University	Oct. 2022
Volunteer and Public Welfare Excellence Award, Tsinghua University	Oct. 2022
Five-Star Volunteer Honor (with volunteering hours 300+), Tsinghua University	June 2022
1^{st} *Prize of Beijing in the National High School Mathematics League*, Chinese Mathematical Society	Sept 2019

Leadership & Volunteering

Core member of the Student Union Sports Department of IIIS	Mar. 2022 - present
Volunteer in *The Beijing 2022 Winter Olympic Games*	Feb. 2022

Skills

- **Programming Languages and Tools**: Python, Go, C/C++, Git, LaTeX
- **TOEFL**: 108/120. Reading: 29, Listening: 29, Speaking: 23, Writing: 27 (*MyBest*: 29)
- **GRE**: 327/340. Quantitative: 170/170, Verbal: 157/170, Analytical Writing: 4.0/6.0