Renfei Zhou

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Education

Carnegie Mellon University 2024.08–Present
Ph.D. in Computer Science, advised by William Kuszmaul and Guy E. Blelloch

Tsinghua University 2020.09–2024.06
B.Eng. in Computer Science, Yao Class, Institute for Interdisciplinary Information Sciences
- Thesis: *Time Lower Bounds for Classical Open-Addressing*

Selected Awards and Fellowships

- **Frontiers of Science Award** 2025.07
  International Congress of Basic Science (ICBS); awarded to two papers on matrix multiplication
- **Jane Street Graduate Research Fellowship** 2025.03
  Awarded to 9 PhD students worldwide
- **MongoDB PhD Fellowship** 2025.03
  Awarded to 3 PhD students worldwide
- **Outstanding Bachelor Thesis Award (Tsinghua University)** 2024.06
  Awarded to 4 students in Yao Class

Selected Publications

Authors are in alphabetical order.

Fast Concurrent Primitives Despite Contention
Michael A. Bender, Guy E. Blelloch, Martín Farach-Colton, Yang Hu, Rob Johnson, Rotem Oshman, **Renfei Zhou**. In *Proc. SPAA*, 2026.

Succinct Dynamic Rank/Select: Bypassing the Tree-Structure Bottleneck
William Kuszmaul, Jingxun Liang, **Renfei Zhou**. In *Proc. SODA*, 2026.

Static Retrieval Revisited: To Optimality and Beyond
Yang Hu, William Kuszmaul, Jingxun Liang, Huacheng Yu, Junkai Zhang, **Renfei Zhou**. In *Proc. FOCS*, 2025.

Optimal Static Dictionary with Worst-Case Constant Query Time
Yang Hu, Jingxun Liang, Huacheng Yu, Junkai Zhang, **Renfei Zhou**. In *Proc. STOC*, 2025.

More Asymmetry Yields Faster Matrix Multiplication
Josh Alman, Ran Duan, Virginia Vassilevska Williams, Yinzhan Xu, Zixuan Xu, **Renfei Zhou**. In *Proc. SODA*, 2025.

New Bounds for Matrix Multiplication: From Alpha to Omega
Virginia Vassilevska Williams, Yinzhan Xu, Zixuan Xu, **Renfei Zhou**. In *Proc. SODA*, 2024.
Covered in Quanta Magazine; Frontiers of Science Award 2025.

Faster Matrix Multiplication via Asymmetric Hashing
Ran Duan, Hongxun Wu, **Renfei Zhou**. In *Proc. FOCS*, 2023.
Covered in Quanta Magazine; Frontiers of Science Award 2025.

Dynamic "Succincter"
Tianxiao Li, Jingxun Liang, Huacheng Yu, **Renfei Zhou**. In *Proc. FOCS*, 2023.

Tight Cell-Probe Lower Bounds for Dynamic Succinct Dictionaries
Tianxiao Li, Jingxun Liang, Huacheng Yu, **Renfei Zhou**. In *Proc. FOCS*, 2023.
Covered in Quanta Magazine.

Visits and Internships

- **Massachusetts Institute of Technology** 2023.03–2023.08
  Visiting Student Researcher, hosted by Virginia Vassilevska Williams
- **Shanghai University of Finance and Economics** 2021.06–2021.08
  Research Intern, advised by Zhihao Gavin Tang
- **Megvii Technology** 2021.01–2021.02
  Research Intern

Teaching

- **Randomized Algorithms (CMU)** Fall 2024
  Teaching Assistant (Instructor: William Kuszmaul)
- **Theory of Computation (Tsinghua University)** Spring 2022
  Teaching Assistant (Instructor: Ran Duan)

Service

- **Concurrent Data Structures Workshop (NYU Tandon)** 2026.01
  Organizer
- **Princeton Workshop on Data Structures** 2025.04
  Organizer
- **Yao Class Research Seminar** 2023–2024
  Co-organizer; invited speaker
- **Yao Class Course-Review Seminar** 2020–2023
  Co-organizer; main speaker for multiple courses
- **Conference Reviewing:** FOCS (2024, 2026), STOC 2025, SODA (2024, 2025, 2026), CCC 2026, ICALP (2024, 2026), SOSA 2026, ESA 2026, ISAAC 2024, SWAT 2026
- **Journal Reviewing:** Algorithmica (2025)

Additional Publications

Authors are in alphabetical order except for papers marked with an asterisk (*).

The Local/Global Disk Problem: How to Use Shared High-Bandwidth Storage Economically
Michael A. Bender, Philip Bille, Martín Farach-Colton, Jeremy Fineman, Inge Li Gørtz, Michael T. Goodrich, Hanna Komlós, Bradley C. Kuszmaul, William Kuszmaul, Rose Silver, Todd Veldhuizen, **Renfei Zhou**. In *Proc. SPAA*, 2026.

Local Samplers for Product Distributions
Jordan Horacsek, Chin Ho Lee, Igor Shinkar, Emanuele Viola, **Renfei Zhou**. In *Proc. ICALP*, 2026.

Workload-Aware Incremental Reclustering in Cloud Data Warehouses*
Yipeng Liu, **Renfei Zhou**, Jiaqi Yan, Huanchen Zhang. In *Proc. SIGMOD*, 2026.

Fingerprint Filters Are Optimal
William Kuszmaul, Jingxun Liang, **Renfei Zhou**. In *Proc. FOCS*, 2025.

Optimal Static Fully Indexable Dictionaries
Jingxun Liang and **Renfei Zhou**. In *Proc. ICALP*, 2025.

Optimal Non-Oblivious Open Addressing
Michael A. Bender, William Kuszmaul, **Renfei Zhou**. In *Proc. STOC*, 2025.

Tight Bounds and Phase Transitions for Incremental and Dynamic Retrieval
William Kuszmaul, Aaron Putterman, Tingqiang Xu, Hangrui Zhou, **Renfei Zhou**. In *Proc. SODA*, 2025.

Tight Bounds for Classical Open Addressing
Michael A. Bender, William Kuszmaul, **Renfei Zhou**. In *Proc. FOCS*, 2024.

Dynamic Dictionary with Subconstant Wasted Bits per Key
Tianxiao Li, Jingxun Liang, Huacheng Yu, **Renfei Zhou**. In *Proc. SODA*, 2024.

Bidder Selection Problem in Position Auctions: A Fast and Simple Algorithm via Poisson Approximation
Nick Gravin, Yixuan Even Xu, **Renfei Zhou**. In *Proc. ACM Web Conference (WWW)*, 2024. **Oral.**

Listing 6-Cycles
Ce Jin, Virginia Vassilevska Williams, **Renfei Zhou**. In *Proc. SOSA*, 2024.

On the Perturbation Function of Ranking and Balance for Weighted Online Bipartite Matching
Jingxun Liang, Zhihao Gavin Tang, Yixuan Even Xu, Yuhao Zhang, **Renfei Zhou**. In *Proc. ESA*, 2023.

Additional Awards

- **China National Scholarship** 2023.10
  Awarded to 4–5 students in Yao Class
- **Yao Award (Silver Medal)** 2023.09
  Awarded to 3 students in Yao Class
- **Tsinghua University Comprehensive Excellence Scholarship** 2021.12 and 2022.12
- **China Collegiate Programming Contest Finals (Gold Award)** 2021.05
  3rd place nationwide (with teammates Yixuan Even Xu and Binwei Yan)
- **ACM International Collegiate Programming Contest, Asia Regional Contest, Jinan Site (Gold Medal)**
  1st place (with teammates Binwei Yan and Zheyu Zhang) 2020.12
- **International Olympiad in Informatics China Team Selection** 2020.08
  5th place nationwide
- **China National Olympiad in Informatics (Gold Medal)** 2019.07
  11th place nationwide