

# RUNZHOU TAO

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## CONTACT INFORMATION

Phone: +1 (929) 319-8781  
Email: runzhou.tao@columbia.edu  
DBLP: <https://dblp.org/pid/228/8097.html>  
Google Scholar: <https://scholar.google.com/citations?user=IOEoZyQAAAAJ&hl=en>  
Website: <http://cs.columbia.edu/~tao>  
Address: 489 CSB, 500 West 112th Street, New York, NY 10027, USA

## EDUCATION

2019–2024(expected) Ph.D. in Computer Science,  
Columbia University, New York, NY, U.S.A.  
Advisor: [Ronghui Gu](#)  
2021 M.S. in Computer Science,  
Columbia University, New York, NY, U.S.A.  
2019 B.E. in Computer Science,  
Yao Class, Institute for Interdisciplinary Information Sciences,  
Tsinghua University, Beijing, China

## RESEARCH INTERESTS

Programming language, formal verification, quantum computing, theoretical computer science

## RESEARCH EXPERIENCE

2022 Summer Amazon Web Services, New York, NY, USA  
Applied Scientist Intern, Amazon Braket, mentored by Yunong Shi  
2021 Summer CertiK, New York, NY, USA  
Research Intern  
2018 Summer Carnegie Mellon University, Pittsburgh, PA, USA  
Research Assistant, advised by [Venkatesan Guruswami](#)  
2018 Spring Harvard University, Cambridge, MA, USA  
Research Assistant, advised by [Boaz Barak](#)  
2017 Summer The University of Hong Kong, Hong Kong, China  
Research Assistant, advised by [Zhiyi Huang](#)

## JOURNAL PUBLICATIONS

(Authors in the papers in theoretical computer science are listed in alphabetical order, while other papers are in contribution order.)

- PNAS 120 (21)  
e2218775120 *A Formally Certified end-to-end Implementation of Shor’s Factorization Algorithm*  
Yuxiang Peng, Kesha Hietala, **Runzhou Tao**, Liyi Li, Robert Rand, Michael Hicks,  
Xiaodi Wu.
- J. ACM 69 (6)  
No. 45, 1-35 *Edge-Weighted Online Bipartite Matching* [\[link\]](#)  
Matthew Fahrbach, Zhiyi Huang, **Runzhou Tao**, Morteza Zadimoghaddam.

## CONFERENCE PUBLICATIONS

(Authors in the papers in theoretical computer science are listed in alphabetical order, while other papers are in contribution order.)

- FOCS 2022 *Solving SDP Faster: A Robust IPM Framework and Efficient Implementation* [\[link\]](#)  
Baihe Huang, Shunhua Jiang, Zhao Song, **Runzhou Tao**, Ruizhe Zhang.
- OSDI 2022 *Fast, Automated Inference of Inductive Invariants for Verifying Distributed Protocols*  
Jianan Yao, **Runzhou Tao**, Ronghui Gu, Jason Nieh.
- PLDI 2022 *Giallar: Push-button Verification for the Qiskit Quantum Compiler* [\[link\]](#)  
**Runzhou Tao**, Yunong Shi, Jianan Yao, Xupeng Li, Ali Javadi-Abhari, Andrew W.  
Cross, Frederic T. Chong, Ronghui Gu.
- ITCS 2022 *Symmetric Boolean Factor Analysis with Applications to InstaHide* [\[link\]](#)  
Sitan Chen, Zhao Song, **Runzhou Tao**, Ruizhe Zhang.
- SOSP 2021 *Formal Verification of a Multiprocessor Hypervisor on Arm Relaxed Memory Hardware*  
[\[link\]](#)  
**Runzhou Tao**, Jianan Yao, Xupeng Li, Shih-Wei Li, Jason Nieh, Ronghui Gu.
- OSDI 2021 *DistAI: Data-Driven Automated Invariant Learning for Distributed Protocols* [\[link\]](#)  
**Best paper award** Jianan Yao, **Runzhou Tao**, Ronghui Gu, Jason Nieh, Suman Jana, Gabriel Ryan.
- PLDI 2021 *Gleipnir: Toward Practical Error Analysis for Quantum Programs* [\[link\]](#)  
**Runzhou Tao**, Yunong Shi, Jianan Yao, John Hui, Frederic T. Chong, Ronghui Gu.
- FOCS 2020 *Edge-Weighted Online Bipartite Matching* [\[link\]](#)  
**Best paper award** Matthew Fahrbach, Zhiyi Huang, **Runzhou Tao**, Morteza Zadimoghaddam.
- APPROX 2019 *Streaming Hardness of Unique Games* [\[link\]](#)  
Venkatesan Guruswami, **Runzhou Tao**.
- SODA 2019 *Tight Competitive Ratios of Classic Matching Algorithms in the Fully Online Model* [\[link\]](#)  
Zhiyi Huang, Binghui Peng, Zhihao Gavin Tang, **Runzhou Tao**, Xiaowei Wu, Yuhao  
Zhang.

## AWARDS

- 2021 OSDI 2021 **Jay Lepreau Best Paper Award**
- 2020 FOCS 2020 **Best Paper Award**
- 2019 ACM/ICPC North America Championship, **Finalist**  
Teammates: Hengjie Zhang, Zhengjia Xu
- 2019 ACM/ICPC Regional (New York), **Champion**  
Teammates: Hengjie Zhang, Zhengjia Xu
- 2019 Outstanding Graduate of Tsinghua University
- 2019 Outstanding Graduate of Beijing City
- 2019 **Yao Award**
- 2016 Baidu First-Class Scholarship
- 2015 ACM/ICPC Regional (Hefei), **Gold Medal**  
Teammates: Yue Yu, Shuxin Chen
- 2014 Chinese Mathematical Olympiad, **Gold Medal**
- 2014 (China) National Olympiad in Informatics, **Silver Medal**

## TEACHING EXPERIENCE

- 2020 Fall COMS4236: Introduction to Computational Complexity, Columbia University  
Instructor: Prof. Xi Chen
- 2020 Spring CSEE6180: Modeling and Performance Evaluation, Columbia University  
Instructor: Prof. Vishal Misra
- 2019 Spring Theory of Computation, Tsinghua University  
Instructor: Prof. Ran Duan  
weekly office hours, grading homework assignments and exams.

## SERVICE

- PC Member QCE 2021, 2022
- Reviewer STOC, ICALP, ITP, APLAS