Runzhou Tao

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CONTACT INFORMATION

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8125 Paint Branch Drive College Park, MD 20742

EMPLOYMENT

2024.8 - now Assistant Professor.

University of Maryland, College Park, MD

Department of Computer Science and Institute of Advanced Computer Studies, Fellow of the Joint Center for Quantum Information and Computer Science (QuICS).

EDUCATION

2024.8 Ph.D. in Computer Science,

Columbia University, New York, NY, U.S.A. Thesis: Formal Verification of Quantum Software

Advisor: Ronghui Gu

2021.2 M.S. in Computer Science,

Columbia University, New York, NY, U.S.A.

2019.8 B.Eng. in Computer Science,

Yao Class, Institute for Interdisciplinary Information Sciences,

Tsinghua University, Beijing, China

RESEARCH INTERESTS

Programming language, formal verification and operating system support for quantum computing

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) A Formally Certified end-to-end Implementation of Shor's Factorization Algorithm

 e2218775120 Yuxiang Peng, Kesha Hietala, **Runzhou Tao**, Liyi Li, Robert Rand, Michael Hicks,
 Xiaodi Wu.
- J. ACM 69 (6) Edge-Weighted Online Bipartite Matching
 - No. 45, 1-35 Matthew Fahrbach, Zhiyi Huang, Runzhou Tao, Morteza Zadimoghaddam.

Conference Publications

Authors in the papers in theoretical computer science (FOCS, ITCS, APPROX, SODA) are listed in alphabetical order, while other papers are in contribution order. * denotes equal contribution

- POPL 2024 A Case for Synthesis of Recursive Quantum Unitary Programs Haowei Deng*, Runzhou Tao*, Yuxiang Peng, Xiaodi Wu.
- POPL 2024 Mostly Automated Verification of Liveness Properties for Distributed Protocols with Ranking Functions
 Jianan Yao, Runzhou Tao, Ronghui Gu, Jason Nieh.
- FOCS 2022 Solving SDP Faster: A Robust IPM Framework and Efficient Implementation 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

 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 Sitan Chen, Zhao Song, Runzhou Tao, Ruizhe Zhang.
- SOSP 2021 Formal Verification of a Multiprocessor Hypervisor on Arm Relaxed Memory Hardware Runzhou Tao, Jianan Yao, Xupeng Li, Shih-Wei Li, Jason Nieh, Ronghui Gu.
- OSDI 2021 DistAI: Data-Driven Automated Invariant Learning for Distributed Protocols
- 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
 Runzhou Tao, Yunong Shi, Jianan Yao, John Hui, Frederic T. Chong, Ronghui Gu.
 - FOCS 2020 Edge-Weighted Online Bipartite Matching
- Best paper award Matthew Fahrbach, Zhiyi Huang, Runzhou Tao, Morteza Zadimoghaddam.
 - APPROX 2019 Streaming Hardness of Unique Games Venkatesan Guruswami, **Runzhou Tao**.
 - SODA 2019 Tight Competitive Ratios of Classic Matching Algorithms in the Fully Online Model Zhiyi Huang, Binghui Peng, Zhihao Gavin Tang, **Runzhou Tao**, Xiaowei Wu, Yuhao Zhang.

AWARDS

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

TEACHING EXPERIENCE

2024 Spring	COMS4115: Programming Languages and Translators, Columbia University Instructor: Prof. Ronghui Gu
2020 Fall	${\rm COMS4236} :$ 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

 ${\bf Reviewer} \quad {\bf STOC}, {\bf ICALP}, {\bf ITP}, {\bf APLAS}$