Xiaoyu Chen

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Research Interests

Randomized algorithms, MCMC methods, Statistical physics phase transitions

Appointments

Postdoctoral Associate in Computer Science (2025 — **present**) — Massachusetts Institute of Technology, LIDS

Education

Ph.D. student in Computer Science (2020 — 2025) — Nanjing University
Advisor: Professor Yitong Yin

B.Eng. in Computer Science (2016 — 2020) — University of Electronic Science and Technology of China
Advisor: Professor Mingyu Xiao & Yi Zhou

Honors and Awards

National Scholarship	MOE of PRC	2021
Outstanding Graduate Student	UESTC	2020
Rank 8 of IEEEXtreme 12.0 Programming Competition	IEEE	2018
Silver Medal of The ACM-ICPC Asia Regional Contest, Beijing Site	ACM	2017

Publications

15 Faster mixing of the Jerrum-Sinclair chain — FOCS 2025
with Weiming Feng, Zhe Ju, Tianshun Miao, Yitong Yin, Xinyuan Zhang

14 Rapid mixing on random regular graphs beyond uniqueness — FOCS 2025
with Zejia Chen, Zongchen Chen, Yitong Yin, Xinyuan Zhang

13 Deterministic counting from coupling independence — FOCS 2025
with Weiming Feng, Heng Guo, Xinyuan Zhang, Zongrui Zou

12 Rapid mixing at the uniqueness threshold — STOC 2025
with Zongchen Chen, Yitong Yin, Xinyuan Zhang

11 Rapid mixing via coupling independence for spin systems with unbounded degree — RANDOM 2025
with Weiming Feng

10 Efficient Parallel Ising Samplers via Localization Schemes — RANDOM 2025
with Hongyang Liu, Yitong Yin, Xinyuan Zhang

9 Optimal mixing for randomly sampling edge colorings on trees down to the max degree — SODA 2025
with Charlie Carlson, Weiming Feng, Eric Vigoda

8 Spectral independence beyond total influence on trees and related graphs — SODA 2025
with Xiongxin Yang, Yitong Yin, Xinyuan Zhang

7 Near-linear time samplers for matroid independent sets with applications RANDOM 2024
with Heng Guo, Xinyuan Zhang, Zongrui Zou

6 Uniqueness and rapid mixing in the bipartite hardcore model FOCS 2023
with Jingcheng Liu, Yitong Yin

5 A near-linear time sampler for the Ising model with external field SODA 2023
with Xinyuan Zhang

4 Optimal mixing for two-state anti-ferromagnetic spin systems FOCS 2022
with Weiming Feng, Yitong Yin, Xinyuan Zhang

3 Rapid mixing of Glauber dynamics via spectral independence for all degrees FOCS 2021
with Weiming Feng, Yitong Yin, Xinyuan Zhang invited to SICOMP special issue

2 Exact algorithms for maximum weighted independent set on sparse graphs COCOON 2021
with Sen Huang, Mingyu Xiao

1 Computing maximum k-defective cliques in massive graphs
with Yi Zhou, Jin-Kao Hao, Mingyu Xiao Comput. Oper. Res. 127 (2021)

Manuscript

1 Optimal mixing time for the Ising model in the uniqueness regime
with Weiming Feng, Yitong Yin, Xinyuan Zhang arXiv:2111.03034

Talks

Rapid mixing via coupling independence for spin systems with unbounded degree
RANDOM, 2025

Optimal mixing for randomly sampling edge colorings on trees down to the max degree
SODA, 2025

Near-linear time samplers for matroid independent sets with applications
RANDOM, 2024

Analyzing Mixing Time of Random Walks via High-dimensional Expander
Summer School, The Beauty of Theoretical Computer Science, 2024

Uniqueness and rapid mixing in the bipartite hardcore model.
Markov Chain Monte Carlo 2.0 (NII Shonan meeting No.186), 2023
FOCS, 2023
Seminar Talk, UCSB, 2023
Seminar Talk, SCMS Student Seminar, 2023

Field dynamics: A new algorithmic tool for fast Gibbs sampling without degree restriction.
CCF TCS PhD Forum, online, 2022

Teaching Assistantships

Computation Method Nanjing University Spring 2022, Spring 2023
Instructor: Jingcheng Liu

Advanced Algorithms Nanjing University Fall 2021
Instructor: Yitong Yin

Service

External reviewer for: RANDOM 2022, SODA 2024, STOC 2025, COCOON 2025, SODA 2025