

# Xiaoyu Chen

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MIT, Cambridge, US

**Research Interests** Randomized algorithms, MCMC methods, Statistical physics phase transitions

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## Appointments

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**Postdoctoral Associate** (2025 – present) Massachusetts Institute of Technology  
LIDS

## Education

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**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  
Advisor: Professor Mingyu Xiao & Yi Zhou and Technology of China

## Honors and Awards

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CCF Doctoral Dissertation Incentive Program	China Computer Federation	2025
National Scholarship	MOE of PRC	2021
Outstanding Graduate Student	UESTC	2020
Rank 8 of IEEEExtreme 12.0 Programming Competition	IEEE	2018
Silver Medal of The ACM-ICPC Asia Regional Contest, Beijing Site	ACM	2017

## Publications

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- 15 Faster mixing of the Jerrum-Sinclair chain with Weiming Feng, Zhe Ju, Tianshun Miao, Yitong Yin, Xinyuan Zhang FOCS 2025
- 14 Rapid mixing on random regular graphs beyond uniqueness with Zejia Chen, Zongchen Chen, Yitong Yin, Xinyuan Zhang FOCS 2025
- 13 Deterministic counting from coupling independence with Weiming Feng, Heng Guo, Xinyuan Zhang, Zongrui Zou FOCS 2025
- 12 Rapid mixing at the uniqueness threshold with Zongchen Chen, Yitong Yin, Xinyuan Zhang STOC 2025
- 11 Rapid mixing via coupling independence for spin systems with unbounded degree with Weiming Feng RANDOM 2025
- 10 Efficient parallel Ising samplers via localization schemes with Hongyang Liu, Yitong Yin, Xinyuan Zhang RANDOM 2025
- 9 Optimal mixing for randomly sampling edge colorings on trees down to the max degree with Charlie Carlson, Weiming Feng, Eric Vigoda SODA 2025
- 8 Spectral independence beyond total influence on trees and related graphs with Xiongxin Yang, Yitong Yin, Xinyuan Zhang SODA 2025

7	Near-linear time samplers for matroid independent sets with applications with Heng Guo, Xinyuan Zhang, Zongrui Zou	RANDOM 2024
6	Uniqueness and rapid mixing in the bipartite hardcore model with Jingcheng Liu, Yitong Yin	FOCS 2023
5	A near-linear time sampler for the Ising model with external field with Xinyuan Zhang	SODA 2023
4	Optimal mixing for two-state anti-ferromagnetic spin systems with Weiming Feng, Yitong Yin, Xinyuan Zhang	FOCS 2022
3	Rapid mixing of Glauber dynamics via spectral independence for all degrees with Weiming Feng, Yitong Yin, Xinyuan Zhang	FOCS 2021 invited to SICOMP special issue
2	Exact algorithms for maximum weighted independent set on sparse graphs with Sen Huang, Mingyu Xiao	COCOON 2021
1	Computing maximum k-defective cliques in massive graphs with Yi Zhou, Jin-Kao Hao, Mingyu Xiao	Comput. Oper. Res. 127 (2021)

## Manuscript

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3	Edge-tilting field dynamics: rapid mixing at the uniqueness threshold and optimal mixing for Swendsen-Wang dynamics with Zhe Ju, Tianshun Miao, Yitong Yin, Xinyuan Zhang	arXiv:2604.10525
2	Subquadratic counting via perfect marginal sampling with Zongchen Chen, Kuikui Liu, Xinyuan Zhang	arXiv:2604.02235
1	Optimal mixing time for the Ising model in the uniqueness regime with Weiming Feng, Yitong Yin, Xinyuan Zhang	arXiv:2111.03034

## Talks

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Faster mixing of the Jerrum-Sinclair chain

FOCS, 2025

Algorithms and Complexity Seminar, MIT, 2025

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

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

Advanced Algorithms Nanjing University Fall 2021  
Instructor: Yitong Yin

## Service

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