Weiming Feng

School of Informatics
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https://fwm94.github.io/

Current Positions

Research Associate in School of Informatics (2021 – now) University of Edinburgh

Education

Ph.D. in Computer Science (2016 – 2021) Nanjing University
Field: Theoretical Computer Science
Advisor: Professor Yitong Yin

B.Eng. in Network Engineering (2012 – 2016) University of Electronic Science and Technology of China

Research Interests

Theoretical Computer Science:

- sampling & counting algorithms;
- discrete probability.

Honors

Outstanding Doctoral Dissertation Award (2021) China Computer Federation
National Scholarship (2019) MOE of PRC
Microsoft Research Asia Fellowship (2018) MSRA
Gold Medals in ACM-ICPC Asia Regional Contests (2014-2015) ACM

Publications

Publications

1. Weiming Feng, Heng Guo, Mark Jerrum, Jiaheng Wang.
   A simple polynomial-time approximation algorithm for the total variation distance between product two distributions.
   In **SOSA** 2023: 343-347.
2. Xiaoyu Chen, Weiming Feng, Yitong Yin, Xinyuan Zhang.
   Optimal mixing for two-state anti-ferromagnetic spin systems.
   In **FOCS** 2022: 588-599.
3. Weiming Feng, Heng Guo, Jiaheng Wang
   Improved bounds for randomly colouring simple hypergraphs.
   In **RANDOM** 2022: volume 245 of LIPIcs, pages 25:1–25:17.
4. Weiming Feng, Heng Guo, Yitong Yin and Chihao Zhang.
   Rapid mixing from spectral independence beyond the Boolean domain.
   ACM Transactions on Algorithms 18(3): 28:1-28:32 (2022).
   Conference version in **SODA** 2021: 1558-1577.

5. Weiming Feng, Heng Guo and Yitong Yin.
   Perfect sampling from spatial mixing.
   Random Structures & Algorithms 61(4): 678-709 (2022).
6. Xiaoyu Chen, Weiming Feng, Yitong Yin, Xinyuan Zhang.
   Rapid mixing of Glauber dynamics via spectral independence for all degrees.
   In **FOCS** 2021: 137-148.
7. Weiming Feng, Heng Guo, Yitong Yin and Chihao Zhang.
   Fast sampling and counting k-SAT solutions in the local lemma regime.
   Journal of the ACM 68 (6), 1-42, 2021.
   Conference version in **STOC** 2020: 854-867.
8. Weiming Feng, Nisheeth K. Vishnoi and Yitong Yin.
   Dynamic sampling from graphical models.
   SIAM Journal on Computing, 50(2), 350–381. 2021.
   In **STOC** 2019: 1070-1081.
9. Weiming Feng, Kun He and Yitong Yin.
   Sampling constraint satisfaction solutions in the local lemma regime.
   In **STOC** 2021: 1565-1578.
10. Weiming Feng, Thomas P. Hayes and Yitong Yin.
    Distributed Metropolis sampler with optimal parallelism.
    In **SODA** 2021: 2121-2140.
11. Weiming Feng, Kun He, Xiaoming Sun and Yitong Yin.
    Dynamic inference in probabilistic graphical models.
    In **ITCS** 2021: 25:1-25:20.
12. Weiming Feng, Yuxin Sun and Yitong Yin.
    What can be sampled locally?
    Distributed Computing, 33, 227–253. 2020.
    Conference version in **PODC** 2017: 121-130.
13. Weiming Feng and Yitong Yin.
    On local distributed sampling and counting.
    In **PODC** 2018: 189-198.

PREPRINTS

14. Charilaos Efthymiou, Weiming Feng
    On the mixing time of Glauber dynamics for the hard-core and related models on $G(n, d/n)$
15. Weiming Feng, Heng Guo, Chunyang Wang, Jiaheng Wang, Yitong Yin.
    Towards derandomising Markov chain Monte Carlo
    CoRR abs/2211.03487 (2022).
16. Weiming Feng, Jiaheng Wang, Heng Guo.
    Swendsen-Wang dynamics for the ferromagnetic Ising model with external fields.
    CoRR abs/2205.01985 (2022).

Talks and Posters

Towards derandomising Markov chain Monte Carlo

Seminar Talk, University of Science and Technology of China, Hefei, China, 2023

A simple polynomial-time approximation algorithm for the total variation distance between two product distributions

CFCS Youth Forum, Peking University, Beijing, China, 2023

Swiss Winter School on Theoretical Computer Science, Zinal, Switzerland, 2023

An MCMC approach to the sampling Lovász local lemma.

DIMAP Seminar, University of Warwick, Coventry, UK, 2022

Optimal mixing for two-state anti-ferromagnetic spin systems.

FOCS, Denver, Colorado, US, 2022

Field dynamics: a new tool to boost mixing results.

UCSB Summer School, UC Santa Barbara, Santa Barbara, California, US, 2022

Algorithms and Complexity Theory Seminar, University of Oxford, Oxford, UK, 2022

Rapid mixing of Glauber dynamics via spectral independence for all degrees.

HALG, LSE, London, UK, 2022

FOCS, online, 2022

IFCS Lab Lunch, University of Edinburgh, Edinburgh, UK, 2022

Chengdu Algorithm & Logic Seminar, UESTC, Chengdu, China, 2021

Rapid mixing from spectral independence beyond the Boolean domain.

SODA, online, 2021

Distributed Metropolis sampler with optimal parallelism.

SODA, online, 2021

Fast sampling and counting k-SAT solutions in the local lemma regime.

SIGMA Seminar, Institute of Computing Technology, Chinese Academy of Sciences, online, 2020

STOC, online, 2020

IJTCS, online, 2020

Dynamic sampling from graphical models

Nanjing Theory Day, Nanjing University, Nanjing, China, 2019

STOC, Phoenix, Arizona, US, 2019

NCTCS, Lanzhou University, Lanzhou, China, 2019

Microsoft PhD Summit, Microsoft Research Redmond, Redmond, Washington, US, 2019

Local distributed sampling

Microsoft Research Asia, Beijing, China, 2018

Teaching Assistantships

Advanced Algorithms (Fall 2019) Nanjing University

Instructor: Yitong Yin

Advanced Algorithms (Fall 2018) Nanjing University

Instructor: Yitong Yin

Research Visits

University of Warwick, Coventry, UK — Nov. 2022
Visiting scholar, hosted by Charilaos Efthymiou

Carnegie Mellon University, Pittsburgh, US — Nov. 2022
Visiting scholar, hosted by Prasad Tetali

Queen Mary, University of London, London, UK — June 2022
Visiting scholar, hosted by Mark Jerrum

University of Edinburgh, Edinburgh, UK — Sept. 2019 -- Dec. 2019
Visiting student, advised by Heng Guo

Shanghai Jiao Tong University, Shanghai, China — Sept. 2018 -- Jan. 2019
Visiting student, advised by Chihao Zhang

Service

External reviewer for: STOC 2021, STOC 2022, STOC 2023, RANDOM 2022, SODA 2022, SICOMP, IPL.
Organizer (with Xiaoming Sun, Jialin Zhang and Zhijie Zhang) of CCF TCS PhD Forum 2020.