

Jiaheng Wang

Laboratory for Foundations of Computer Science,
Informatics Forum, University of Edinburgh, Scotland, EH8 9AB, UK
Email: pw384@hotmail.com (Personal) / jiaheng.wang@ed.ac.uk (Term time)
Homepage: <https://pw384.github.io/>

EMPLOYMENT

- Postdoctoral researcher University of Edinburgh, 2023 -

EDUCATION

- Ph.D. student University of Edinburgh, 2020 - 2023
Thesis: *Algorithms and complexity for approximately counting hypergraph colourings and related problems*
Advisor: Heng Guo
- B.Sc. *summa cum laude* in Computer Science (*Turing Class*) Peking University, 2016 - 2020

RESEARCH VISITING

- IT University of Copenhagen / BARC 07/2023 - 08/2023
Host: Radu Curticapean
- University of Oxford 06/2023
Host: Andreas Galanis and Leslie Ann Goldberg
- Queen Mary, University of London 06/2022
Host: Mark Jerrum
- Shanghai University of Finance and Economics 05/2020 - 09/2020
Host: Pinyan Lu
- University of Edinburgh 07/2019 - 08/2019
Host: Heng Guo
- Institute of Computing Technology, Chinese Academy of Sciences 09/2018 - 01/2020
Host: Xiaoming Sun

RESEARCH INTERESTS

- General theoretical computer science, especially algorithms and complexity of counting problems.
- Discrete mathematics, including extremal combinatorics and probabilistic combinatorics.

RESEARCH ARTICLES

- [9] **The complexity of computing fermionants and flow-like structures in graphs, modulo p .**
Isja Mannens and J. Wang.
submitted
- [8] **Approximate counting for spin systems in sub-quadratic time.**
Konrad Anand, Weiming Feng, Graham Freifeld, Heng Guo and J. Wang.
[C] 51th International Colloquium on Automata, Languages and Programming (ICALP 2024)
arXiv: 2306.14867
- [7] **Inapproximability of counting independent sets in linear hypergraphs.**
Guoliang Qiu and J. Wang.
[J] Information Processing Letters, Volume 184, Article 106448, 1–6, 2024
arXiv: 2212.03072

Last update: 14/04/2024 dd/mm/yyyy. Author lists are sorted in the alphabetical order. [J]: Journal, [C]: Conference.

- [6] **Towards derandomising Markov chain Monte Carlo.**
Weiming Feng, Heng Guo, Chunyang Wang, **J. Wang** and Yitong Yin.
[C] 64th IEEE Symposium on Foundations of Computer Science (FOCS 2023)
arXiv: 2211.03487
- [5] **A simple polynomial-time approximation algorithm for the total variation distance between two product distributions.**
Weiming Feng, Heng Guo, Mark Jerrum and **J. Wang**.
[J] *TheoretiCS, Volume 2 (2023), Article 8, 1–7*
[C] 6th SIAM Symposium on Simplicity in Algorithms (SOSA 2023)
arXiv: 2208.00740
- [4] **Swendsen-Wang dynamics for the ferromagnetic Ising model with external fields.**
Weiming Feng, Heng Guo and **J. Wang**.
[J] *Information and Computation, Volume 294, Article 105066, 1–34, 2023*
arXiv: 2205.01985
- [3] **Improved bounds for randomly colouring simple hypergraphs.**
Weiming Feng, Heng Guo and **J. Wang**.
[C] 26th International Conference on Randomization and Computation (RANDOM 2022)
arXiv: 2202.05554
- [2] **Inapproximability of counting hypergraph colourings.**
Andreas Galanis, Heng Guo and **J. Wang**.
[J] *ACM Transactions on Computation Theory, 14(3–4):10, pp. 1–33, 2022*
arXiv: 2107.05486
- [1] **On the degree of Boolean functions as polynomials over \mathbb{Z}_m .**
Xiaoming Sun, Yuan Sun, **J. Wang**, Kewen Wu, Zhiyu Xia and Yufan Zheng.
[C] 47th International Colloquium on Automata, Languages and Programming (ICALP 2020)
arXiv: 1910.12458

HONOURS AND AWARDS

- Informatics Global PhD Scholarship (3.5 years) University of Edinburgh, 2020
- 4 awards/scholarships during undergraduate study Peking University

SERVICES AND ACTIVITIES

- Served as an external reviewer at conferences: ICALP'21, SODA'21
- Student organizer of SAGT'18 (organizing volunteers, getting involved in press, etc.)

TALKS

- Approximate counting for spin systems in sub-quadratic time
 - Peking University, Beijing, China
 - Shanghai Jiao Tong University, Shanghai, China
 - NII Shonan Meeting No. 186 “MCMC 2.0”, Kanagawa, Japan
- Towards derandomising Markov chain Monte Carlo
 - Basic Algorithm Research Copenhagen (BARC), Denmark
- A simple polynomial-time approximation algorithm for the total variation distance between two product distributions
 - University of Science and Technology of China, Hefei, China
 - QuACT classical talk, Beijing, China
 - Algorithms and Complexity Theory Seminars, Oxford, United Kingdom

- LFCS Lab Lunch, Edinburgh, United Kingdom
- SOSA 2023, Florence, Italy
- Improved bounds for randomly colouring simple hypergraphs
 - APPROX/RANDOM 2022, Champaign, IL, United States (virtual conference)
 - Highlights of Algorithms, LSE & QMUL, London, United Kingdom
- Inapproximability of counting hypergraph colourings
 - CS Peer Talk, Peking University, Beijing, China (virtual)
 - Highlights of Algorithms, LSE & QMUL, London, United Kingdom
- On the degree of Boolean functions as polynomials over \mathbb{Z}_m .
 - ICALP 2020, Saarbrücken, Germany (virtual conference)

TEACHING

- At University of Edinburgh:
 - INFR08026 Introduction to Algorithms and Data Structures Teaching Assistant/Tutor, 2022/23
 - INFR11201 Randomized Algorithms Tutor, 2022 Autumn
 - INFR08026 Introduction to Algorithms and Data Structures Teaching Assistant/Tutor, 2021/22
- At Peking University:
 - 04834010 Randomized Algorithms Teaching Assistant, 2020 Spring
 - 04833440 Introduction to the Theory of Computation Teaching Assistant, 2020 Spring
 - 04833040/04832363 Introduction to Computer Systems Teaching Assistant/Tutor, 2019 Fall
 - 04833440 Introduction to the Theory of Computation Teaching Assistant, 2019 Spring
 - 04833040/04832363 Introduction to Computer Systems Teaching Assistant/Tutor, 2018 Fall