

CV

PERSONAL

Full Name: Shuo Pang
Address: Rebslagervej 10, Copenhagen 2400, Denmark
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RESEARCH

Computational complexity, discrete math, proof complexity, optimization

EMPLOYMENT

- Lecturer, University of Bristol 2025/5–
Department of Computer Science
- Postdoc, University of Copenhagen 2022/11–2025/5
Host: Jakob Nordström
- Invited visiting scientist, Simons Institute at UC Berkeley 2023/3–2023/5
Program: SAT Extended Reunion

EDUCATION

- Ph.D. in Mathematics, University of Chicago 2016/10–2022/4
Dissertation: Some Results in Proof Complexity and SAT Solving
Adviser: Alexander Razborov
- B.S. in Mathematics, Peking University 2012/9–2016/7

REFEREE

- Journal: Computational Complexity (2020,2021), SIAM Journal on Discrete Mathematics (2023), Journal of the ACM (2024), ACM Transactions on Computational Logic (2024)
- Conference: STOC (2019,2023,2025,2025), CCC (2021,2024), SAT (2023,2024), ICALP (2024,2024)

CONFERENCE

1. Annual IEEE Symposium on Foundations of Computer Science (FOCS 2024) 2024/11
Paper & talk, *Sum-of-Squares Lower Bounds for Non-Gaussian Component Analysis*
2. Annual IEEE Symposium on Foundations of Computer Science (FOCS 2023) 2023/11
Paper, *Graph Colouring Is Hard on Average for Polynomial Calculus and Nullstellensatz*
3. Computational Complexity Conference (CCC 2021) 2021/7
Paper & talk, *SoS Degree Lower Bounds for Exact Planted Clique*
4. International Computer Science Symposium in Russia (CSR 2021) 2021/7
Paper & talk, *Large Clique Is Hard on Average for Resolution*
5. Theory and Applications of Satisfiability Testing (SAT 2020) 2020/7
Paper, *On CDCL-based Proof Systems with the Ordered Decision Strategy*

WORKSHOP & SEMINAR

1. MIAO seminar, University of Copenhagen 2024/12
Invited talk, *Graph Colouring is Hard on Average for Polynomial Calculus and Nullstellenatz*
2. Combinatorics and TCS Seminar, University of Chicago 2024/10
Invited talk, *Supercritical Tradeoffs and Tight Lifting*
3. Workshop on New Frontiers in Robust Statistics, Toyota Technology Institute Chicago
Organizers: Ilias Diakonikolas, Gautam Kamath, and Daniel M. Kane 2024/6
Invited talk, *Sum-of-Squares Lower Bounds for Non-Gaussian Component Analysis: Challenges and New Techniques*
4. Automata Seminar, Faculty of Mathematics, Informatics, and Mechanics, University of Warsaw 2024/4
Invited talk, *Robust Trade-off for Weisfeiler–Leman via Compression*
Hosted by Mikołaj Bojańczyk
5. Proof Complexity and Beyond, Oberwolfach Workshop 2024/3
Invited talk, *Supercritical and Robust Trade-off for Resolution Depth Versus Width and Weisfeiler–Leman*
6. Danish Digitalization, Data Science and AI Conference (D3A) by Danish Data Science Academy and Digital Research Center Denmark 2024/2
Invited talk, *Graph Colouring is Hard on Average for Polynomial Calculus and Nullstellenatz*
7. SAT Extended Reunion, Simons Institute at UC Berkeley 2023/3
Invited visiting scientist. Talk: *Graph Colouring is Hard on Average for Polynomial Calculus and Nullstellensatz*
8. MIAO seminar, University of Copenhagen 2022/12
Invited talk, *SoS Degree Lower Bound for Exact Clique*
9. Complexity Workshop, Banff International Research Station 2020/1
Invited talk, *(Mildly) Large Clique is Hard on Average for Resolution*
10. BARC seminar and MIAO seminar, University of Copenhagen and Lund University 2019/9
Invited talks, *Large Clique is Hard on Average for Resolution* and *On CDCL-based Proof Systems with the Ordered Decision Strategy*
Hosted by Jakob Nordström
11. Complexity Theory Workshop, Clay Math Institute 2018/7
Student attendee
12. Math REU at Peking University 2014
Project *On Bott Periodicity*, supervised by Houhong Fan

TEACHING

Instructor 2018–21

Undergraduate courses in math, University of Chicago (f/w/s: fall/winter/spring quarter)

- *Calculus I* (MATH 15100, f19)
- *Calculus II* (MATH 15200, f18, w20, f21)
- *Calculus III* (MATH 15300, w19, s19, s20, f20, w21)

Co-instructor

Graduate courses in computer science, University of Copenhagen 2023–24

- *Computability and Complexity* with Jakob Nordström (2023) and with Jakob Nordström, Srikanth Srinivasan and Amir Yehudayoff (2024)

TA

Courses in math, University of Chicago 2017–18

- *Honors Calculus 3* with Sarah Ziesler (MATH 16300, fall 2017)
- *Point Set Topology* with Kurt Vinhage (MATH 26200, winter 2018)
- *Complex Variables* with Danny Calegari (MATH 27000, fall 2018)

PUBLICATION

- 1 Truly Supercritical Trade-offs for Resolution, Cutting Planes, Monotone Circuits, and Weisfeiler-Leman** 2024
Joint with Susanna De Rezende, Noah Fleming, Duri Janett, and Jakob Nordström
STOC 2025
- 2 Sum-of-Squares Lower Bounds for Non-Gaussian Component Analysis** 2024
Joint with Ilias Diakonikolas, Sushrut Karmalkar, and Aaron Potechin
FOCS 2024
- 3 Graph Colouring Is Hard on Average for Polynomial Calculus and Nullstellensatz** 2023
Joint with Jonas Conneryd, Susanna De Rezende, Jakob Norström, and Kilian Risse
FOCS 2023
- 4 SoS Lower Bound for Exact Planted Clique** 2021
CCC 2021
- 5 On CDCL-Based Proof Systems With the Ordered Decision Strategy** 2019
Joint with Nathan Mull and Alexander Razborov
SAT 2020, SIAM Journal on Computing (SICOMP) 2022
- 6 Large Clique Is Hard on Average for Resolution** 2019
CSR 2021, Sochi

AWARD

- EU Horizon MSCA Postdoctoral Fellowship 2024–26
NoShortProof, 230774.40 EUR

REFERENCE

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| Alexander Razborov Professor Department of Mathematics Department of Computer Science University of Chicago & Steklov Mathematical Institute razborov@math.uchicago.edu | Jakob Nordström Professor Department of Computer Science University of Copenhagen & Lund University jn@di.ku.dk | Aaron Potechin Assistant Professor Department of Computer Science University of Chicago potechin@uchicago.edu |
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