

# CV

## PERSONAL INFORMATION

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Full Name: Shuo Pang  
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## RESEARCH INTERESTS

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Computational complexity, discrete math, proof complexity, optimization

## EMPLOYMENTS

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- Postdoc, University of Copenhagen 2022/11–Present  
Host: Jakob Nordström  
Funded by EU MSCA postdoctoral fellowship since 2024/4
- Invited visiting scientist, Simons Institute at UC Berkeley 2023/3–2023/5  
Program: SAT Extended Reunion

## EDUCATION

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- 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

## PEER REVIEWS

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- 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)

## CONFERENCES

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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*

## WORKSHOPS AND SEMINARS

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1. MIAO seminar, University of Copenhagen 2024/12  
Invited talk, *Graph Colouring is Hard on Average for Polynomial Calculus and Nullstellensatz*
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 Nullstellensatz*
7. SAT Extended Reunion, Simons Institute at UC Berkeley 2023/3–2023/5  
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  
Student attendee
12. Math REU at Peking University 2014  
Project *On Bott Periodicity*, supervised by Houhong Fan

## TEACHING EXPERIENCE

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- 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)

## PUBLICATIONS

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- 1 Truly Supercritical Trade-offs for Resolution, Cutting Planes, Monotone Circuits, and Weisfeiler-Leman** 2024  
Joint work with Susanna DeRezende, Noah Fleming, Duri Janett, and Jakob Nordström
- 2 Sum-of-Squares Lower Bounds for Non-Gaussian Component Analysis** 2024  
Joint work with Ilias Diakonikolas, Sushrut Karmalkar, and Aaron Potechin  
FOCS 2024
- 3 Graph Colouring Is Hard on Average for Polynomial Calculus and Nullstellensatz** 2023  
Joint work with Jonas Conneryd, Susanna DeRezende, Jakob Nordström, and Kilian Risse  
FOCS 2023
- ★ **Some Results in Proof Complexity and SAT Solving** 2022  
PhD dissertation, UChicago open access
- 4 SoS Lower Bound for Exact Planted Clique** 2021  
CCC 2021
- 5 On CDCL-Based Proof Systems With the Ordered Decision Strategy** 2019  
Joint work with Nathan Mull and Alexander Razborov  
SAT 2020, SIAM Journal on Computing (SICOMP), Volume 51, Issue 4, 2022
- 6 Large Clique Is Hard on Average for Resolution** 2019  
CSR 2021 (16th International Computer Science Symposium in Russia)

## AWARDS

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### Fellowships

- EU Horizon MSCA Postdoctoral Fellowship, Project NoShortProof 2024/4–Present  
Amount: 230774.40 EUR
- S. McCormick Fellowship, University of Chicago 2016–17

### Student Contest

- S.-T. Yau College Student Math Contest, 1st in Team, 3rd in Geometry & Topology 2015
- The Chinese Mathematics Competition, first prize 2014
- High school MO: CMO silver (2012), CWMO gold (2010), CNMO gold (2010)

## REFERENCE

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