Susanna F. de Rezende

susanna.rezende@cs.lth.se
https://derezende.github.io/

Institutionen för datavetenskap
Lunds universitet
Klas Anselms väg 10, 221 00 Lund, Sweden

Current Position

Assistant professor (biträdande universitetslektor) in Algorithms and Complexity
Department of Computer Science, LTH, Lund University

Education

2019 Ph.D. in Computer Science, KTH Royal Institute of Technology, Sweden

2014 M.Sc. in Computer Science, University of São Paulo, Brazil

2011 B.Sc. in Computer Science, University of São Paulo, Brazil

Positions and Long-Term Visits

- Assistant Professor, Department of Computer Science, Lund University, Sweden (Dec 2021 –)
- Visiting Scholar, Simons Institute for the Theory of Computing, Berkeley CA, USA (Jan–Apr 2023)
  Program: Meta-complexity
- Postdoc, Institute of Mathematics of the Czech Academy of Sciences, Czechia (Dec 2019 – Nov 2021)
  with grant from the Knut and Alice Wallenberg Foundation and hosted by Pavel Pudlák
- Research Fellow, Simons Institute for the Theory of Computing, Berkeley CA, USA (Jan–May 2021)
  Program: Satisfiability: Theory, Practice, and Beyond
- Research Fellow, Simons Institute for the Theory of Computing, Berkeley CA, USA (Aug–Dec 2018)
  Program: Lower Bounds in Computational Complexity

Research Grants

2025–2029 WASP Academic Doctoral Student Position

2025–2029 Wallenberg Academy Fellowship

2022–2026 WASP Academic Doctoral Student Position

2022–2025 VR Research project grant within natural and engineering sciences

2021–2027 ELLIIT BUL recruitment

2019–2021 and 2021–2023 Knut and Alice Wallenberg Postdoctoral Scholarship Program

2021 Simons-Berkeley Research Fellowship

2018 Simons-Berkeley Google Research Fellowship

Recognition

- Appointed as a Wallenberg Academy Fellow, 2023
- Simons-Berkeley Research Fellowship for Satisfiability: Theory, Practice, and Beyond, 2021
- Featured as one of the "rising stars" women in theoretical computer science at STOC, 2020
- Stockholm Mathematics Centre Prize for Excellent Doctoral Dissertation, 2019
- Simons-Berkeley Research Fellowship for Lower Bounds in Computational Complexity, 2018
- M.Sc. thesis selected among top 10 in CS in Brazil, Brazilian Society of Computation (SBC), 2014
- Gold Medal at V National Symposium of Scientific Initiation, IMPA, 2010

Research team and supervision

I am the main supervisor of two PhD students: Noel Arteche (since 2022) and David Engström (since 2024). I am also co-supervising six other PhD students (from Lund University, University of Copenhagen and Linköping University), and in the past I have supervised two internship students who are now PhD students, one at the University of Copenhagen and the other at the University of Cambridge. I am hosting two postdoc from fall 2025: Kilian Risse and Morgan Shirley.

I have also hosted a number of short-term visitors (one or two weeks) from EPFL, Charles University, Memorial University, University of Toronto, University of Cambridge, Boston University, University of Warwick, and the Institute of Mathematics of the Czech Academy of Science. These visits resulted in new research collaborations and projects, some of which have already led to joint papers.

Teaching

Advanced Algorithms (2023 and 2024)
Discrete Structures in Computer Science (2022 and 2025)
Teacher assistant in: Logic for Computer Science (2015-2016), Data-structure, Algorithms and Complexity (2015-2016), Algorithms and Complexity (2015), Linear programming (2011), Calculus I (2009)

Invited talks at conferences and related events

- Jun 2025 Invited speaker at CIAC '25, Rome, Italy
- Mar 2025 Invited speaker at STACS '25, Jena, Germany
- Dec 2024 Invited speaker at FSTTCS 2024 pre-conference workshop, IIT Gandhinagar, India
- Jun 2022 Invited speaker at Logic Colloquium, Reykjavik, Iceland
- May 2019 Invited speaker Gödel Lecture special session at ASL, New York, USA

Invited survey talks at workshops

- Mar 2024 Proof Complexity and Beyond, Oberwolfach, Germany
- Jan 2023 Meta-complexity, Simons Institute, Berkeley CA, USA
- Oct 2022 Theory and Practice of SAT and Combinatorial Solving, Dagstuhl, Germany
- Jul 2022 Mathematical Approaches to Lower Bounds, ICMS, Edinburgh, UK
- Jun 2022 Satisfiability: Theory, Practice, and Beyond Reunion, Simons Institute, Berkeley CA, USA
- Sep 2021 Rigorous Evidence for Information-Computation Trade-offs, Simons Institute, USA
- May 2021 Theoretical Foundations of SAT/SMT Solving, Simons Institute, Berkeley CA, USA
- Mar 2021 50 Years of Satisfiability, Simons Institute, Berkeley CA, USA
- Jun 2020 TCS Women Rising Stars workshop at STOC '20

Invited talks at seminar series

- Nov 2023 Oxford-Warwick Complexity Meetings, UK
- Dec 2021 Tel Aviv University theory seminar, Israel
- Feb 2021 Oxford-Warwick Complexity Meetings, UK
- Oct 2020 TCS+ seminar

Recent Invited Workshops

Prestigious, highly selective, invitation-only research meetings (∼40 researchers). It provides a platform for personal interactions and open exchange, discussions of new ideas, problems and research directions.

- Dagstuhl Seminar 25111 Computational Complexity of Discrete Problems, Germany, Mar '25
- Dagstuhl Seminar 24421 SAT and Interactions, Oct '24
- Proof Complexity and Beyond, Mathematisches Forschungsinstitut Oberwolfach, Germany, Mar '24
- Dagstuhl Seminar 23111 Computational Complexity of Discrete Problems, Germany, Mar '23
- Dagstuhl Seminar 22411 Theory and Practice of SAT and Combinatorial Solving, Germany, Oct '22
- Communication Complexity and Applications III, BIRS, Banff, Canada, Jul '22

Professional service

Organization of workshops

- Co-organizer of Complexity as a Kaleidoscope School for PhD students, 2025
- Co-organizer of Proof Complexity Beyond Propositional Logic Special Session at ASL, March 2023
- Co-organizer of the Proof Complexity Workshop at FOCS '21, February 2022
- Local organizer of Future Digileaders, Stockholm, November 2019
- Main organizer of the Rising Stars at KTH workshop, April 2019
- Main organizer of career-development seminar and workshop at KTH, April 2017

Program committees

- ACM Symposium on Theory of Computing (STOC) 2025
- Computational Complexity Conference (CCC) 2023
- ACM Symposium on Theory of Computing (STOC) 2023
- FLoC proof complexity workshop 2022
- IEEE Foundation of Computer Science (FOCS) 2021
- International Joint Conference on Artificial Intelligence (IJCAI) 2021
- Computer Science in Russia (CSR) 2021

Other

- Editorial board for ZML: Zeitschrift für Mathematische Logik & Grundlagen der Mathematik, 2025-
- Member of Board of Trustees for Computational Complexity Foundation Inc. (CCF), 2023-2026
- Steering committee for Algorithmic Research-Cooperation around Oresund (ARCO), 2023–
- Editorial board for the Mathematical Logic Quarterly Journal, 2023-2025
- Guest editor for Special Issue of Theory of Computing Systems on selected papers from CSR '21
- Journal refereeing for SICOMP, Algorithmica, Information and Computation, Journal of Graph Theory, ACM Transactions on Computation Theory, Discrete Applied Mathematics
- Reviewer for conferences: FOCS, STOC, CCC, MFCS, CSR, SAT, STACS, ESA, LATIN
- Co-initiator and committee member of Women PhD Candidates (WOP) at KTH network, 2016–2019

Research Papers

See Google scholar, ORCID

1. Noel Arteche, Albert Atserias, Susanna F. de Rezende, and Erfan Khaniki. **The Proof Analysis Problem**. To appear in *Proceedings of the 66th Annual IEEE Symposium on Foundations of Computer Science (FOCS '25)*, December 2025.

2. Susanna F. de Rezende and Marc Vinyals. **Lifting with Colourful Sunflowers**. In *Proceedings of the 40th Annual Computational Complexity Conference (CCC '25)*, August 2025.

3. Gaia Carenini and Susanna F. de Rezende. **On the Automatability of Tree-Like k-DNF Resolution**. In *Proceedings of the 40th Annual Computational Complexity Conference (CCC '25)*, August 2025.

4. Susanna F. de Rezende, Noah Fleming, Duri Andrea Janett, Jakob Nordström, and Shuo Pang. **Truly Supercritical Trade-offs for Resolution, Cutting Planes, Monotone Circuits, and Weisfeiler-Leman**. In *Proceedings of the 57th Annual ACM Symposium on Theory of Computing (STOC '25)*, June 2025.

5. Susanna F. de Rezende, Aaron Potechin, and Kilian Risse. **Clique Is Hard on Average for Unary Sherali-Adams**. In *Proceedings of the 64th Annual IEEE Symposium on Foundations of Computer Science (FOCS '23)*, pages 12–25, November 2023.

6. Jonas Conneryd, Susanna F. de Rezende, Jakob Nordström, Shuo Pang, and Kilian Risse. **Graph Colouring Is Hard on Average for Polynomial Calculus and Nullstellensatz**. In *Proceedings of the 64th Annual IEEE Symposium on Foundations of Computer Science (FOCS '23)*, pages 1–11, November 2023.

7. Susanna F. de Rezende, Mika Göös, Robert Robere. **Proofs, Circuits, and Communication**. In *SIGACT News Complexity Theory Column*, March 2022.

8. Susanna F. de Rezende, Massimo Lauria, Jakob Nordström, and Dmitry Sokolov. **The Power of Negative Reasoning**. In *Proceedings of the 36th Annual Computational Complexity Conference (CCC '21)*, July 2021.

9. Albert Atserias, Ilario Bonacina, Susanna F. de Rezende, Massimo Lauria, Jakob Nordström, and Alexander Razborov. **Clique Is Hard on Average for Regular Resolution**. *Journal of the ACM*, June 2021. Preliminary version in *STOC '18*.

10. Susanna F. de Rezende, Mika Göös, Jakob Nordström, Toniann Pitassi, Robert Robere, and Dmitry Sokolov. **Automating Algebraic Proof Systems Is NP-Hard**. In *Proceedings of the 53rd Annual ACM Symposium on Theory of Computing (STOC '21)*, pages 209–222, June 2021.

11. Susanna F. de Rezende. **Automating Tree-Like Resolution in Time $n^{o(\log n)}$ Is ETH-Hard**. In *Proceedings of the 11th Latin and American Algorithms, Graphs and Optimization Symposium (LAGOS '21)*, May 2021.

12. Susanna F. de Rezende, Or Meir, Jakob Nordström, and Robert Robere. **Nullstellensatz Size-Degree Trade-offs from Reversible Pebbling**. *Computational Complexity*, volume 30, article 4, February 2021. Preliminary version in *CCC '19*.

13. Susanna F. de Rezende, Or Meir, Jakob Nordström, Toniann Pitassi, and Robert Robere. **KRW Composition Theorems via Lifting**. In *Proceedings of the 61st Annual IEEE Symposium on Foundations of Computer Science (FOCS '20)*, pages 43–49, November 2020.

14. Susanna F. de Rezende, Or Meir, Jakob Nordström, Toniann Pitassi, Robert Robere, and Marc Vinyals. **Lifting with Simple Gadgets and Applications to Circuit and Proof Complexity**. In *Proceedings of the 61st Annual IEEE Symposium on Foundations of Computer Science (FOCS '20)*, pages 24–30, November 2020.

15. Susanna F. de Rezende, Jakob Nordström, Dmitry Sokolov, and Kilian Risse. **Exponential Resolution Lower Bounds for Weak Pigeonhole Principle and Perfect Matching Formulas over Sparse Graphs**. In *Proceedings of the 35th Annual Computational Complexity Conference (CCC '20)*, volume 169, pages 28:1–28:24, July 2020.

16. Joël Alwen, Susanna F. de Rezende, Jakob Nordström, and Marc Vinyals. **Cumulative Space in Black-White Pebbling and Resolution**. In *Proceedings of the 8th Innovations in Theoretical Computer Science Conference (ITCS '17)*, volume 67, pages 38:1–38:21, January 2017.

17. Susanna F. de Rezende, Jakob Nordström, and Marc Vinyals. **How Limited Interaction Hinders Real Communication (and What It Means for Proof and Circuit Complexity)**. In *Proceedings of the 57th Annual IEEE Symposium on Foundations of Computer Science (FOCS '16)*, pages 295–304, October 2016.

18. Julio Araujo, Nathann Cohen, Susanna F. de Rezende, Frédéric Havet, and Phablo F.S. Moura, **On the proper orientation number of bipartite graphs**. *Theoretical Computer Science*, volume 566, pages 59–75, February 2015.

19. Susanna F. de Rezende, Cristina G. Fernandes, Daniel M. Martin, and Yoshiko Wakabayashi. **Intersecting Longest Paths**. *Discrete Mathematics*, volume 313, number 12, pages 1401–1408, June 2013.

20. Susanna F. de Rezende, Cristina G. Fernandes, Daniel M. Martin, and Yoshiko Wakabayashi. **Intersection of Longest Paths in a Graph**. *Electronic Notes in Discrete Mathematics (EuroComb '11)*, 38:743–748, September 2011.