Susanna F. de Rezende

CONTACT INFORMATION
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CURRENT POSITION
Assistant professor at the Department of Computer Science, LTH, Lund University

RESEARCH INTERESTS
Computational complexity, proof and circuit complexity, communication complexity, graph theory and algorithms

EDUCATION

School of Electrical Engineering and Computer Science, **KTH Royal Institute of Technology**, **Stockholm, Sweden**

Ph.D. in Computer Science, August 2014 – August 2019

- PhD Thesis: Lower Bounds and Trade-offs in Proof Complexity
- Advisor: Prof. Jakob Nordström

Institute of Mathematics and Statistics, **University of São Paulo**, **Brazil**

M.Sc. in Computer Science, March 2012 – May 2014

- Master's Dissertation: Longest Paths in Graphs
- Advisor: Prof. Yoshiko Wakabayashi
- Funding: Grant from Fapesp 11/16348-0

B.Sc. in Computer Science, February 2008 – December 2011

- Scientific Initiation Scholarship, August 2009 – February 2012
  - Title: *Topics in Combinatorics and Graph Theory*
  - Advisor: Prof. Yoshiko Wakabayashi
  - Funding: Grants from CNPq 116402/2009-1, 123740/2010-0, 800430/2011-5

POSITIONS

Department of Computer Science, LTH Lund University, Lund, Sweden

Assistant Professor, December 2021 (current)

Institute of Mathematics of the Czech Academy of Sciences, **Prague, Czech Republic**

Postdoc, December 2019 – November 2021

- Host: Professor Pavel Pudlák
- Funding: Grant from the Knut and Alice Wallenberg Foundation

Simons Institute for the Theory of Computing, **Berkeley CA, USA**

Research Fellow, January – May 2021

- Program: Satisfiability: Theory, Practice, and Beyond

Simons Institute for the Theory of Computing, **Berkeley CA, USA**

Research Fellow, August – December 2018

- Program: Lower Bounds in Computational Complexity

Research Grants

- VR Research project grant within natural and engineering sciences
- Knut and Alice Wallenberg Postdoctoral Scholarship Program
- Simons-Berkeley Google Research Fellowship

Awards and Honors

- Featured as one of the "rising stars" women in TCS at STOC 2020 – June 25, 2020
- Prize for Excellent Doctoral Dissertation 2018/2019 awarded by Stockholm Mathematics Centre (SMC).
- M.Sc. thesis selected among the top 10 in Brazil in the area of Computer Science in 2014 by the Brazilian Society of Computation (SBC)
- B.Sc. degree awarded Honorable Mention for Outstanding Achievement, Apr 2012
- Gold Medal in the V National Symposium of Scientific Initiation held at the Institute of Pure and Applied Mathematics (IMPA), Rio de Janeiro, Nov 2010

Selected Invited Talks

- Dec 2021 Tel Aviv University theory seminar, Israel
- Sep 2021 Rigorous Evidence for Information-Computation Trade-offs, Simons Institute, Berkeley CA, USA
- Mar 2021 50 Years of Satisfiability, Simons Institute, Berkeley CA, USA
- Mar 2021 Theoretical Foundations of SAT/SMT Solving, Simons Institute, Berkeley CA, USA
- Feb 2021 Oxford-Warwick Complexity Meetings, UK
- Oct 2020 TCS+ seminar
- Jun 2020 TCS Women Rising Stars workshop at STOC '20
- Jan 2020 Proof Complexity, BIRS, Canada
- Jul 2019 Algebraic Techniques in Computational Complexity, BIRS, Canada
- May 2019 Gödel Lecture special session, ASL North American Annual Meeting, New York City NY, USA
- Nov 2018 Google, Mountain View CA, USA
- Sep 2018 Boolean Devices, Simons Institute, Berkeley CA, USA
- Aug 2018 Theory and Practice of Satisfiability Solving, CMO, Mexico
- Aug 2017 Proof Complexity and Beyond, Oberwolfach, Germany

Invited Workshops

- Dagstuhl Seminar 20061 - SAT and Interactions – held at Dagstuhl, Germany, February 2 - 7, 2020
- Proof Complexity – held at Banff International Research Station (BIRS), Canada, January 19 - 24, 2020
  - Presentation: Lifting with Simple Gadgets and Applications to Circuit and Proof Complexity
- Algebraic Techniques in Computational Complexity – held at Banff International Research Station (BIRS), Canada, July 7 - 12, 2019
  - Presentation: Lifting with Simple Gadgets and Applications to Circuit and Proof Complexity
- Theory and Practice of Satisfiability Solving – held at Casa Matemática Oaxaca (CMO), Mexico, August 26 - 31, 2018
  - Presentation: Clique is Hard for State-of-the-Art Algorithms

- Proof Complexity and Beyond – held at Mathematisches Forschungsinstitut Oberwolfach, Germany, August 13 - 19, 2017
  - Presentation: Clique is Hard on Average for Regular Resolution
- Dagstuhl Seminar 14421 - Optimal algorithms and proofs – held at Dagstuhl, Germany, October 12 - 17, 2014

Other activities

- Co-organiser 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
- Co-initiator and committee member of the Women PhD Candidates at KTH network (WOP@KTH), 2016–2019
- Main organizer of career-development seminar and workshop at KTH, April 2017

Research Papers

Google scholar profile: https://scholar.google.com/citations?user=AZRM7A8AAAAJ

1. Susanna F. de Rezende, Mika Göös, Robert Robere. **Proofs, Circuits, and Communication**. In *SIGACT News Complexity Theory Column*, March 2022.
2. 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.
3. 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. (ECCC)
4. 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. (ECCC)
5. 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. (arXiv, ECCC)
6. 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. (arXiv, ECCC)
7. Susanna F. de Rezende, Jakob Nordström, Dmitry Sokolov, and Kilian Risse. **Exponential 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. (ECCC)
8. 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*. (ECCC)

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

10. 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.

11. 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. (ECCC)

12. 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.

13. 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. Preliminary version in *EuroComb '11*.