

Susanna F. de Rezende

CONTACT INFORMATION	Email: rezende@math.cas.cz Homepage: https://derezende.github.io/ Address: Žitná 25 115 67 Praha 1, Czech Republic
CURRENT POSITION	Postdoc at the Institute of Mathematics of the Czech Academy of Sciences in Prague, Czech Republic hosted by Professor Pavel Pudlák with a grant from the Knut and Alice Wallenberg Foundation Research Fellow in the program Satisfiability: Theory, Practice, and Beyond at the Simons Institute for the Theory of Computing, Berkeley CA, USA
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 Theoretical Computer Science, August 2014 – August 2019 <ul style="list-style-type: none">◦ 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 <ul style="list-style-type: none">◦ 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 <ul style="list-style-type: none">◦ GPA 8.8 (out of 10)◦ Scientific Initiation Scholarship, August 2009 – February 2012<ul style="list-style-type: none">◦ Title: <i>Topics in Combinatorics and Graph Theory</i>◦ Advisor: Prof. Yoshiko Wakabayashi◦ Funding: Grants from CNPq 116402/2009-1, 123740/2010-0, 800430/2011-5
POSITIONS	Simons Institute for the Theory of Computing, Berkeley CA, USA Research Fellow, January – May 2021 <ul style="list-style-type: none">◦ Program: Satisfiability: Theory, Practice, and Beyond Institute of Mathematics of the Czech Academy of Sciences, Prague, Czech Republic Postdoc, January 2020 – December 2021 <ul style="list-style-type: none">◦ 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, August – December 2018

- Program: Lower Bounds in Computational Complexity

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 SMC (Stockholm Mathematics Centre).
- M.Sc. thesis selected by CSBC (Congress of the Brazilian Society of Computer Science) among the top 10 in Brazil in the area of Computer Science in 2014
- 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

PARTICIPATION IN CONFERENCES

- FOCS 2020 – Virtual conference, November 16 - 19, 2020
 - Presentation: KRW Composition Theorem via Lifting
 - Accepted paper: Lifting with Simple Gadgets and Applications to Circuit and Proof Complexity
- CCC 2020 – Virtual conference, July 28 - 30, 2020
 - Accepted paper: Exponential Resolution Lower Bounds for Weak Pigeonhole Principle and Perfect Matching Formulas over Sparse Graphs
- TCS Women Spotlight Workshop, STOC 2020 – June 25, 2020
 - Invited talk: Finding Algebraic Proofs is NP-Hard
- CCC 2019 – New Brunswick, NJ, USA, July 18 - 20, 2019
 - Presentation: Nullstellensatz Size-Degree Trade-offs from Reversible Pebbling
- STOC 2018 – Los Angeles, CA, USA, June 25 - 29, 2018
 - Presentation: Clique is Hard on Average for Regular Resolution
- ITCS 2017 – Berkeley, CA, USA, January 8 - 11, 2017
 - Accepted paper: Cumulative Space in Black-White Pebbling and Resolution
- FOCS 2016 – New Brunswick, NJ, USA, October 9 - 11, 2016
 - Presentation: How Limited Interaction Hinders Real Communication (and What It Means for Proof and Circuit Complexity)
- ICGT 2014 – Grenoble, France, June 30 - July 4, 2014
 - Accepted extended abstract: On the Proper Orientation Number of Bipartite Graphs
- EuroComb 2011 – Budapest, Hungary, August 29 - September 2, 2011
 - Presentation: Intersection of Longest Paths in a Graph

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

SELECTED

INVITED TALKS

- 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
- 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

OTHER

ACTIVITIES

- 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

LANGUAGE

PROFICIENCY

English, Portuguese and Spanish	Fluent
Swedish and French	Intermediate
German	Basic

RESEARCH

PAPERS

1. **Susanna F. de Rezende**, Or Meir, Jakob Nordström, Robert Robere, “Nullstellensatz Size-Degree Trade-offs from Reversible Pebbling”, *computational complexity*, **30**, 4 (2021).
2. **Susanna F. de Rezende**, “Automating Tree-Like Resolution in Time $n^{o(\log n)}$ Is ETH-Hard”, submitted manuscript, 2021.
3. **Susanna F. de Rezende**, Mika Göös, Jakob Nordström, Toniann Pitassi, Robert Robere, Dmitry Sokolov, “Automating Algebraic Proof Systems is NP-Hard”, Technical Report TR20-064, *Electronic Colloquium on Computational Complexity (ECCC)*, to appear in STOC '21.
4. **Susanna F. de Rezende**, Or Meir, Jakob Nordström, Toniann Pitassi, Robert Robere, “KRW Composition Theorems via Lifting”, in *Proceedings of the 61st Annual IEEE Symposium on Foundations of Computer Science (FOCS '20)*, November 2020.
5. **Susanna F. de Rezende**, Or Meir, Jakob Nordström, Toniann Pitassi, Robert Robere, 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)*, November 2020.
6. **Susanna F. de Rezende**, Jakob Nordström, Dmitry Sokolov, 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)*, July 2020.
7. **Susanna F. de Rezende**, Or Meir, Jakob Nordström, Robert Robere, “Nullstellensatz Size-Degree Trade-offs from Reversible Pebbling”, in *Proceedings of the 34th Computational Complexity Conference (CCC '19)*, July 2019.
 8. Albert Atserias, Ilario Bonacina, **Susanna F. de Rezende**, Massimo Lauria, Jakob Nordström, Alexander Razborov, “Clique is Hard on Average for Regular Resolution”, in *Proceedings of the 50th Annual ACM Symposium on Theory of Computing (STOC '18)*, June 2018. To appear in JACM.
 9. Joël Alwen, **Susanna F. de Rezende**, Jakob Nordström, Marc Vinyals, “Cumulative Space in Black-White Pebbling and Resolution”, in *Proceedings of the 8th Innovations in Theoretical Computer Science Conference (ITCS '17)*, 67:38:1–38:21, January 2017.
 10. **Susanna F. de Rezende**, Jakob Nordström, 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)*, 295–304, October 2016.
 11. Julio Araujo, Nathann Cohen, **Susanna F. de Rezende**, Frédéric Havet, Phablo F.S. Moura, “On the proper orientation number of bipartite graphs”, *Theoretical Computer Science*, 566:59–75, February 2015.
 12. **Susanna F. de Rezende**, Cristina G. Fernandes, Daniel M. Martin, Yoshiko Wakabayashi, “Intersecting Longest Paths”, *Discrete Mathematics*, 313(12):1401–1408, June 2013.
 13. **Susanna F. de Rezende**, Cristina G. Fernandes, Daniel M. Martin, Yoshiko Wakabayashi, “Intersection of Longest Paths in a Graph”, *Electronic Notes in Discrete Mathematics (EuroComb '11)*, 38:743–748, September 2011.