Kilian Risse

Curriculum Vitae

Department of Computer Science, LTH
Lund University

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dblp

Research Interests

Computational Complexity with a focus on Proof Complexity.

Positions

08.2025 – 10.2026 LTH, Lund University, Lund, Sweden
Postdoctoral Researcher
Host: Susanna de Rezende

02.2023 – 07.2025 EPFL, Lausanne, Switzerland
Postdoctoral Researcher
Host: Ola Svensson

Education

10.2017 – 12.2022 KTH Royal Institute of Technology, Stockholm, Sweden
PhD in Computer Science
Advisors: Per Austrin, Johan Håstad and Jakob Nordström
Thesis: *On Long Proofs of Simple Truths*

09.2015 – 04.2017 ETH Zürich, Zurich, Switzerland
Master of Science in Computer Science
Focus: Theoretical Computer Science
Thesis: *Phases of Unique Sink Orientations*

09.2012 – 09.2015 ETH Zürich, Zurich, Switzerland
Bachelor of Science in Computer Science

Research Grants

10.2017 – 10.2026 Swiss National Science Foundation Postdoc.Mobility Fellowship

Invited Workshops

– Proof Complexity – University of Oxford, United Kingdoms, September 3 - 5, 2024.

  - Presentation: Clique is Hard on Average for Sherali-Admas with Bounded Coefficients

– Proof Complexity and Beyond – Mathematisches Forschungsinstitut Oberwolfach, Germany, March 24 - 29, 2024.

  - Presentation: Clique is Hard on Average for Sherali-Admas with Bounded Coefficients

– Satisfiability: Theory, Practice, and Beyond – Simons Institute for the Theory of Computing at UC Berkeley, USA, April 17 - 21, 2023.

  - Presentation: On bounded depth proofs for Tseitin formulas on the grid; revisited

– Mathematical Approaches to Lower Bounds: Complexity of Proofs and Computation – ICMS Bayes Center, United Kingdoms, July 4 - 8, 2022.

  - Presentation: The Minimum Circuit Size Problem is Hard for SoS

– Proof Complexity – Banff International Research Station, Canada, January 19 - 24, 2020.

  - Presentation: Exponential Lower Bounds for Weak Pigeonhole Principle and Perfect Matching Formulas over Sparse Graphs

– Proof Complexity – Schloss Dagstuhl, Germany, January 28 - Febrauary 2, 2018.

Journal Publications

1. Johan Håstad and Kilian Risse. On bounded depth proofs for tseitin formulas on the grid; revisited. *SIAM Journal on Computing*, 0(0):FOCS22–288–FOCS22–339, 0. doi:10.1137/22M153851X
2. Susanna F. de Rezende, Jakob Nordström, Kilian Risse, and Dmitry Sokolov. Exponential resolution lower bounds for weak pigeonhole principle and perfect matching formulas over sparse graphs. *TheoretiCS*, 4, 2025. doi:10.46298/THEORETICS.25.9
3. Per Austrin and Kilian Risse. Perfect matching in random graphs is as hard as tseitin. *TheoretiCS*, 1, 2022. doi:10.46298/THEORETICS.22.2

Conference Publications

1. Mika Göös, Gilbert Maystre, Kilian Risse, and Dmitry Sokolov. Supercritical tradeoffs for monotone circuits. In Michal Koucký and Nikhil Bansal, editors, *Proceedings of the 57th Annual ACM Symposium on Theory of Computing, STOC 2025, Prague, Czechia, June 23-27, 2025*, pages 1359–1370. ACM, 2025. doi:10.1145/3717823.3718229
2. Susanna F. de Rezende, Aaron Potechin, and Kilian Risse. Clique is hard on average for unary sherali-adams. In *64th IEEE Annual Symposium on Foundations of Computer Science, FOCS 2023, Santa Cruz, CA, USA, November 6-9, 2023*, pages 12–25. IEEE, 2023. doi:10.1109/FOCS57990.2023.00008
3. 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 *64th IEEE Annual Symposium on Foundations of Computer Science, FOCS 2023, Santa Cruz, CA, USA, November 6-9, 2023*, pages 1–11. IEEE, 2023. doi:10.1109/FOCS57990.2023.00007

4. Per Austrin and Kilian Risse. Sum-Of-Squares Lower Bounds for the Minimum Circuit Size Problem. In Amnon Ta-Shma, editor, *38th Computational Complexity Conference (CCC 2023)*, volume 264 of *Leibniz International Proceedings in Informatics (LIPIcs)*, pages 31:1–31:21, Dagstuhl, Germany, 2023. Schloss Dagstuhl – Leibniz-Zentrum für Informatik. Accepted to Theory of Computing. doi:10.4230/LIPIcs.CCC.2023.31

5. Johan Håstad and Kilian Risse. On bounded depth proofs for tseitin formulas on the grid; revisited. In *63rd IEEE Annual Symposium on Foundations of Computer Science, FOCS 2022, Denver, CO, USA, October 31 - November 3, 2022*, pages 1138–1149. IEEE, 2022. doi:10.1109/FOCS54457.2022.00110

6. Per Austrin and Kilian Risse. Perfect matching in random graphs is as hard as tseitin. In Joseph (Seffi) Naor and Niv Buchbinder, editors, *Proceedings of the 2022 ACM-SIAM Symposium on Discrete Algorithms, SODA 2022, Virtual Conference / Alexandria, VA, USA, January 9 - 12, 2022*, pages 979–1012. SIAM, 2022. doi:10.1137/1.9781611977073.43

7. Susanna F. de Rezende, Jakob Nordström, Kilian Risse, and Dmitry Sokolov. Exponential resolution lower bounds for weak pigeonhole principle and perfect matching formulas over sparse graphs. In Shubhangi Saraf, editor, *35th Computational Complexity Conference, CCC 2020, July 28-31, 2020, Saarbrücken, Germany (Virtual Conference)*, volume 169 of *LIPIcs*, pages 28:1–28:24. Schloss Dagstuhl - Leibniz-Zentrum für Informatik, 2020. doi:10.4230/LIPICS.CCC.2020.28