

Yaroslav Alekseev

tolstreg@gmail.com

Biographical Data

1. Citizenship: Russia
2. Date and place of birth: 01.06.1999, Saint-Petersburg, Russia

Research Interests

1. Proof complexity
2. Computational complexity
3. Communication complexity
4. Boolean function analysis

Education

1. **PhD**, *Technion*, Haifa, Israel, 2022 – present. Computer Science Department.
2. **Master**, *Saint-Petersburg State University*, St. Petersburg, Russia, 2020 – 2022.
Academic programme title: Advanced Mathematics. Diploma with distinction.
3. **Bachelor**, *Saint-Petersburg State University*, St. Petersburg, Russia, 2016 – 2020.
Academic programme title: Mathematics. Diploma with distinction.

Research visits

1. From 01.02.2024 to 01.06.2024 was a visitor in a Theory Group in the School of Computer and Communication Sciences (IC School) at *EPFL* in Lausanne, Switzerland.

Awards and fellowships

- Best Student Paper award on Computational Complexity Conference 2021.
<https://www.computationalcomplexity.org/Archive/2021/program.php>
- Young Russian mathematicians competition award for students.
<https://siriusmathcenter.ru/all-russian-conference>
- From 2016 to 2022 was supported by «Native towns», a social investment program 23 of PJSC «Gazprom Neft».
- From 2019 to 2020 was supported by RSF grant.
- From 2021 to 2022 is supported by «Basis» foundation.
- From 2022 supported by Lady Davis Fellowship.

Publications

1. Yaroslav Alekseev, Dima Grigoriev, Edward A. Hirsch, and Iddo Tzameret. Semi-algebraic proofs, IPS lower bounds and the τ -conjecture: Can a natural number be negative? In *Proceedings of the 52nd Annual ACM Symposium on Theory of Computing (STOC 2020)*, pages 54–67, 2020. Full version (57 pages) is submitted to a journal.
<https://dl.acm.org/doi/10.1145/3357713.3384245>
2. Yaroslav Alekseev. A Lower Bound for Polynomial Calculus with Extension Rule. In *36th Computational Complexity Conference (CCC 2021)*, volume 200 of Leibniz International Proceedings in Informatics (LIPIcs), pages 21:1–21:18, Dagstuhl, Germany, 2021.
<https://doi.org/10.4230/LIPIcs.CCC.2021.21>
3. Yaroslav Alekseev, Edward A. Hirsch. The Power of the Binary Value Principle. In *Algorithms and Complexity: 13th International Conference (CIAC 2023)*, Lecture Notes in Computer Science, vol 13898, pages 21–36, Springer, Cham.
https://doi.org/10.1007/978-3-031-30448-4_3
4. Yaroslav Alekseev, Alexander Smal, Yuval Filmus. Lifting Dichotomies. In *39th Computational Complexity Conference (CCC 2024)*. Leibniz International Proceedings in Informatics (LIPIcs), Volume 300, pp. 9:1–9:18, Schloss Dagstuhl – Leibniz-Zentrum für Informatik (2024)
<https://doi.org/10.4230/LIPIcs.CCC.2024.9>
5. Yaroslav Alekseev, Dima Grigoriev, Edward Hirsch. Tropical proof systems. Preprint available on ECCC.
<https://eccc.weizmann.ac.il/report/2024/072/>

6. Yaroslav Alekseev, Dmitry Itsykson. Lifting to regular resolution over parities via games. Preprint available on ECCC.

<https://eccc.weizmann.ac.il/report/2024/128/>