

Dmitry Sokolov

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Biographical Data

Citizenship Russia
Date and place of birth 23th August 1988, Leningrad, USSR

Research Interests

Proof complexity, computational complexity, communication complexity, average-case complexity

Education

- 2011–2015 **PhD.**, *St. Petersburg Department of V.A. Steklov Institute of Mathematics of the Russian Academy of Sciences*, St. Petersburg, Russia.
- Advisors: [E. A. Hirsch](#), [D. M. Itsykson](#)
 - Area of study: proof complexity, computational complexity
 - Thesis title: On the Complexity of Splitting Algorithms for Boolean Satisfiability Problem ([in russian](#))
- 2009–2011 **Master**, *St. Petersburg Academic University of the Russian Academy of Science*, St. Petersburg, Russia.
- Advisor: [D. M. Itsykson](#)
 - Major: Theoretical Computer Science
 - Thesis title: Hard examples for heuristic DPLL algorithm's for SAT
- 2009–2011 **Master**, *St. Petersburg University of Information Technology, Mechanic and Optics*, St. Petersburg, Russia.
- Advisor: [D. M. Itsykson](#)
 - Major: Applied Mathematics and Computer Science
 - Thesis title: Lower bounds of inversion of Goldreich's function
- 2005–2009 **Bachelor**, *St. Petersburg University of Information Technology, Mechanic and Optics*, St. Petersburg, Russia.
- Major: Applied Mathematics and Computer Science
 - Thesis title: An application of genetic algorithms in creation of finite automaton operating the tank model in game Robocode

Additional Education

[Computer Science Club](#)
[Mathematics and physics club](#)

Research Positions

- 2014–present Junior Researcher at [St. Petersburg Department of V.A. Steklov Institute of Mathematics of the Russian Academy of Sciences](#)
- 2013–2013 Early stage researcher at [Charles University](#) Participant of Prague Special Semester in Logic and Complexity

Publications

Dmitry Sokolov. Dag-like communication and its applications. *Submitted to CSR 2017*. ECCC TR16-202.

Dmitry Itsykson, Alexander Knop, Andrey Romashchenko, and Dmitry Sokolov. On obdd based algorithms and proof systems that dynamically change order of variables. *Appear in proceedings of STACS 2017*.

Dmitry Itsykson, Alexander Knop, and Dmitry Sokolov. Complexity of Distributions and Average-Case Hardness. In Seok-Hee Hong, editor, *27th International Symposium on Algorithms and Computation (ISAAC 2016)*, volume 64 of *Leibniz International Proceedings in Informatics (LIPIcs)*, pages 38:1–38:12, Dagstuhl, Germany, 2016. Schloss Dagstuhl–Leibniz-Zentrum fuer Informatik.

Dmitry Itsykson, Vsevolod Oparin, Mikhail Slabodkin, and Dmitry Sokolov. Tight lower bounds on the resolution complexity of perfect matching principles. *Fundam. Inform.*, 145(3):229–242, 2016.

Dmitry Itsykson, Alexander Knop, and Dmitry Sokolov. Heuristic time hierarchies via hierarchies for sampling distributions. In Khaled Elbassioni and Kazuhisa Makino, editors, *Algorithms and Computation*, volume 9472 of *Lecture Notes in Computer Science*, pages 201 – 211. Springer Berlin Heidelberg, 2015.

Edward A. Hirsch and Dmitry Sokolov. On the probabilistic closure of the loose unambiguous hierarchy. *Inf. Process. Lett.*, 115(9):725–730, 2015.

Dmitry Itsykson, Anna Malova, Vsevolod Oparin, and Dmitry Sokolov. Tree-like resolution complexity of two planar problems. *CoRR*, abs/1412.1124, 2014.

Dmitry Itsykson and Dmitry Sokolov. Lower bounds for splittings by linear combinations. In *Mathematical Foundations of Computer Science 2014 - 39th International Symposium, MFCS 2014, Budapest, Hungary, August 25-29, 2014. Proceedings, Part II*, pages 372–383, 2014.

Dmitry Sokolov. Lower bounds for DPLL algorithms with splitting over linear functions. 2014. [PDMI Preprint](#).

Dmitry Itsykson and Dmitry Sokolov. On fast heuristic non-deterministic algorithms and short heuristic proofs. *Fundam. Inf.*, 132(1):113–129, January 2014.

Dmitry Itsykson and Dmitry Sokolov. Lower bounds for myopic DPLL algorithms with a cut heuristic. In *Proceedings of the 22nd international conference on Algorithms and Computation*, ISAAC’11, pages 464–473, Berlin, Heidelberg, 2011. Springer-Verlag. ECCC TR12-141.

Dmitry Itsykson and Dmitry Sokolov. The complexity of inversion of explicit goldreich’s function by DPLL algorithms. In *Proceedings of the 6th international conference on Computer science: theory and applications*, CSR’11, pages 134–147, Berlin, Heidelberg, 2011. Springer-Verlag.

Talks

- 2016 “Dag-like communication and its application.” Problems in Theoretical Computer Science, Moscow, Russia

- 2015 “Complexity of distributions and average-case hardness.” Problems in Theoretical Computer Science, Moscow, Russia
- 2015 “Lower Bounds for Splittings by Linear Combinations.” ELC mini-workshop, Tokyo, Japan
- 2014 “Examples of heuristic proof.” Dagstuhl seminar “Optimal algorithms and proofs” (14421)
- 2014 “Lower Bounds for Splittings by Linear Combinations.” [Mathematical Foundations of Computer Science 2014 - 39th International Symposium](#), Budapest, Hungary
- 2013 “Lower bounds on DPLL algorithms with splitting over linear functions on unsatisfiable formulas.” [Franco-Russian workshop on Algorithms, complexity and applications](#), Moscow, Russia
- 2013 “On short heuristic proofs.” [MALOA Final Conference Logic and Interactions](#), Luminy, France
- 2012 “On short heuristic proofs.” [Second Russian Finnish Symposium on Discrete Mathematics \(RuFiDim’12\)](#) , Turku, Finland
- 2011 “Lower bounds for myopic DPLL algorithms with a cut heuristic.” [The 22nd International Symposium on Algorithms and Computation \(ISAAC’11\)](#), Yokohama, Japan
- 2011 “Lower bounds for myopic DPLL algorithms with a cut heuristic.” [First Russian Finnish Symposium on Discrete Mathematics \(RuFiDim’11\)](#), St. Petersburg, Russia
- 2011 “Inverting the explicit Goldreich’s function with DPLL algorithms” [The 6th International Computer Science Symposium in Russia \(CSR’11\)](#), St. Petersburg, Russia

Schools

- 2015 [Swedish Summer School in Computer Science \(S³CS’15\)](#), Stockholm, Sweden
- 2014 [Swedish Summer School in Computer Science \(S³CS’14\)](#), Stockholm, Sweden
- 2013 [Computer Science E-Days \(CSEDays’13\)](#), Ekaterinburg, Russia
- 2012 [17th Estonian Winter School in Computer Science \(EWSCS’12\)](#), Palmse, Estonia

Teaching

- 2011–present [St. Petersburg Academic University](#)
- 2011–present [Computer Science Center](#)

Achievements and awards

- 2014 Young Russian Math Contest (“Dynasty foundation”). Winner
- 2013 The medal of Foundation for support of education and science (Alferov’s foundation)
- 2009 Third diploma of North-Easter European Subregional Contest. [Results](#)

Technical skills

C/C++, Java, Linux, Latex