Dmitry Itsykson
Curriculum Vitae

Name: Dmitry Itsykson
(in Russian Дмитрий Михайлович Ицыксон)

Date of birth: 20.05.1984

Address: Steklov Institute of Mathematics at St. Petersburg, 27 Fontanka, St. Petersburg, 191023, Russia

E-mail: dmitrits@pdmi.ras.ru

web page: http://logic.pdmi.ras.ru/~dmitrits

Research interests: computational complexity, proof complexity, average-case complexity, mathematical logic, combinatorics.

Education and degrees:

2022	Habilitation thesis “Lower bounds and optimality for proof systems”, submitted, expected date of defense 15.06.2022
2009	PhD at Steklov Institute of Mathematics at St. Petersburg, PhD thesis “Average-case complexity of randomized computations with bounded errors” (advisor Edward A. Hirsch), date of defense 29.12.2009.
2001 - 2006	St. Petersburg State University, Department of Mathematics and Mechanics, master's degree in Computer Science.

Affiliations:

2017 - present	leading researcher	Steklov Institute of Mathematics at St. Petersburg, Laboratory of Mathematical Logic
2016 - 2017	academic secretary	
2011 - 2016	senior researcher	
2009 - 2011	junior researcher	
2018 - present	associate professor (docent), part-time	St. Petersburg State University, Faculty of Mathematics and Computer Science
2010 - 2019	associate professor (docent), part-time	St. Petersburg Academic University, Department of Mathematics and Information Technology
2008 - 2010	lecturer	
2004 - 2011	additional education teacher, part-time	Lyceum № 239, center of mathematical education

Teaching experience

I taught the following lecture courses:

1. Mathematical logic, Spring 2009, Fall 2015, Spring 2017 (Academic University), Fall 2018, Spring 2022 (St. Petersburg State University)
2. Discrete mathematics, Fall 2008, Fall 2009 (Academic University)
3. Advanced topics in discrete mathematics, Spring 2009, Spring 2010, Spring 2011, Spring 2012, Spring 2013, Spring 2013, Spring 2015, Spring 2019 (Academic University)
4. Computational complexity theory, Fall 2010, Fall 2011, Fall 2013, Fall 2015, Fall 2016, Fall 2017 (Academic University), Fall 2021 (Computer Science Club)
5. Advanced topics in computational complexity, Spring 2009 (Computer Science Club), Spring 2011, 2013, 2015, 2017, 2019 (Academic University), Fall 2020 (St. Petersburg State University)
6. Propositional proof complexity, Fall 2014, 2017 (Academic University)

7. Randomized methods in Computations, Spring 2012, 2015 (Computer Science Club), Spring 2018 (Academic University), Spring 2021 (St. Petersburg State University)
8. Analysis of Boolean functions, Spring 2014 (Academic University)
9. Foundations of cryptography and average-case complexity, Spring 2010, 2012, 2016 (Academic University)
10. Information theory, Fall 2021 (St. Petersburg State University)
11. Probabilistically checkable proofs, Fall 2012 (Computer Science Club)
12. Theoretical computer science, Fall 2013, 2016, 2020 (Computer Science Club), Fall 2019 - Spring 2020, Fall 2021 - Spring 2022 (St. Petersburg State University)
13. Introduction to computability and complexity, Fall 2012, Fall 2014 (Computer Science club), Fall 2018 (St. Petersburg State University)

From 2004 to 2011 I taught at the Center of mathematical education at Lyceum 239 (additional mathematical education for high school students);
two of my students were winners of International Mathematical Olympiad: Dmitry Egorov (2011) and Dmitry Krachun (2011, 2012, 2013).

From 2013 to 2019 I was responsible for the master's program in theoretical computer science at St. Petersburg Academic University.

Supervision for Master Thesis: Ivan Monakhov (2010), Dmitry Sokolov (2011), Valeriya Nikolaenko (2011), Vsevolod Oparin (2012), Ludmila Glinskih (2017), Svyatoslav Gryznov (2018), Artur Riazanov (2019), Petr Smirnov (2020).

Supervision for PhD Thesis:
Dmitry Sokolov (2015)
Vsevolod Oparin (2016)

Current PhD students:
Svyatoslav Gryznov (2018- present)
Artur Riazanov (2019 - present)
Petr Smirnov (2020 - present)

Current postdoctoral researchers:
Michal Garlik (2020 - present)

Awards

- Award in Leonard Euler contest in the nomination PhD students, 2008.
- Best student paper award at the 4th International Computer Science Symposium in Russia, 2009.
- Best paper award at the 5th International Computer Science Symposium in Russia, 2010.
- Young Russian Mathematics award, 2018, https://ium.mccme.ru/rym/2018/winners-english.html
- Best paper award at the 14th International Computer Science Symposium in Russia, 2019 (joint with Ludmila Glinskih).

Research papers

1. Dmitry Itsykson, Artur Riazanov, Proof Complexity of Natural Formulas via Communication Arguments. In Proceedings of Computational Complexity Conference 2021, LIPIcs vol. 200, 3:1-3:34, 2021.
2. Dmitry Itsykson, Artur Riazanov, Danil Sagunov, Petr Smirnov, Near-Optimal Lower Bounds on Regular Resolution Refutations of Tseitin Formulas for All Constant-Degree Graphs. Comput. Complex. 30(2): 13, 2021.
3. Ludmila Glinskih, Dmitry Itsykson, On Tseitin Formulas, Read-Once Branching Programs and Treewidth. Theory Comput. Syst. 65(3): 613-633, 2021. Preliminary version appeared in Proceedings of CSR 2019, LNCS vol, 11532, 143--155.
4. Sam Buss, Dmitry Itsykson, Alexander Knop, Artur Riazanov, Dmitry Sokolov, Lower Bounds on OBDD Proofs with Several Orders. ACM Trans. Comput. Log. 22(4): 26:1-26:30, 2021.
5. Dmitry Itsykson, Alexander Okhotin, Vsevolod Oparin, Computational and Proof Complexity of Partial String Avoidability. ACM Trans. Comput. Theory 13(1): 6:1-6:25, 2021. Preliminary version appeared in Proceedings of MFCS 2016, LIPIcs. Leibniz Int. Proc. Inform. 58: 51:1-51:13, 2016.
6. Dmitry Itsykson, Alexander Knop, Andrei E. Romashchenko, Dmitry Sokolov, On OBDD-based Algorithms and Proof Systems that Dynamically Change the order of Variables. J. Symb. Log. 85(2): 632-670, 2020. Preliminary version appeared In Proceedings of STACS 2017, LIPIcs. Leibniz Int. Proc. Inform., 66 43:1-43:14, 2017.

7. Dmitry Itsykson, Dmitry Sokolov, Resolution over linear equations modulo two. Ann. Pure Appl. Log. 171(1), 2020
8. Nicola Galesi, Dmitry Itsykson, Artur Riazanov, Anastasia Sofronova, Bounded-Depth Frege Complexity of Tseitin Formulas for All Graphs. In Proceedings of MFCS 2019, LIPIcs vol. 138, 49:1-49:15, 2019
9. Sam Buss, Dmitry Itsykson, Alexander Knop, Dmitry Sokolov, Reordering rule makes OBDD proof systems stronger. In Proceedings of CCC 2018, LIPIcs. Leibniz Int. Proc. Inform., 102 16:1-16:24, 2018.
10. Dmitry Itsykson, Alexander Knop, Hard satisfiable formulas for splittings by linear combinations. In Proceedings of SAT 2017, LNCS 10491:53–61, 2017.
11. Ludmila Glinskih, Dmitry Itsykson, Satisfiable Tseitin formulas are hard for nondeterministic read-once branching programs. In Proceedings of MFCS 2017, LIPIcs. Leibniz Int. Proc. Inform., 83 26:1-26:12, 2017.
12. Dmitry Itsykson, Mikhail Slabodkin, Vsevolod Oparin, and Dmitry Sokolov, Tight lower bounds on the resolution complexity of perfect matching principles. Fund. Inform. 145 (2016), no. 3, 229–242.
13. Dmitry Itsykson, Alexander Knop, Dmitry Sokolov, Complexity of distributions and average-case hardness. In Proceedings of ISAAC 2016, LIPIcs. Leibniz Int. Proc. Inform., 64 38:1-38:12, 2016.
14. Dmitry Itsykson, Alexander Okhotin, and Vsevolod Oparin, Computational and proof complexity of partial string avoidability. In Proceedings of MFCS 2016, LIPIcs. Leibniz Int. Proc. Inform. 58: 51:1-51:13, 2016
15. Dmitry Itsykson, Alexander Knop, and Dmitry Sokolov, Heuristic time hierarchies via hierarchies for sampling distributions. In Proceedings of ISAAC 2015, LNCS 9472: 201–211, 2015.
16. Dmitry Itsykson, Mikhail Slabodkin, and Dmitry Sokolov, Resolution complexity of perfect matching principles for sparse graphs, In Proceedings of CSR 2015, LNCS 9139: 219-230, 2015.
17. Dmitry Itsykson and Dmitry Sokolov, On fast non-deterministic algorithms and short heuristic proofs. Fundamenta Informaticae, 132(1):113-129, 2014.
18. Dmitry Itsykson, Lower bound on average-case complexity of inversion of Goldreich function by "drunken" backtracking algorithms. Theory of Computing Systems, (2014) 54:261–276. Preliminary version appeared in proceedings of CSR 2010, LNCS 6072, pp. 204-215.
19. Dmitry Itsykson and Dmitry Sokolov, Lower bounds for splittings by linear combinations. In Proceedings of MFCS-2014, LNCS 8635: 372-383, 2014.

20. Dmitry Itsykson and Vsevolod Oparin, Graph expansion, Tseitin formulas and resolution proofs for CSP. In Proceedings of CSR 2013, LNCS 7913: 162-173, 2013.
21. Edward A. Hirsch, Dmitry Itsykson, Ivan Monakhov and Alexander Smal On optimal heuristic randomized semidecision procedures, with application to proof complexity and cryptography. Theory of Computing Systems 51:179-195, 2012.
22. Edward A. Hirsch and Dmitry Itsykson, On an optimal randomized acceptor for graph nonisomorphism. Information Processing Letters, 112: 166-171, 2012
23. Edward A. Hirsch, Dmitry Itsykson, Valeria Nikolaenko and Alexander Smal Optimal heuristic algorithms for the image of an injective function. Zapiski Nauchnyh Seminarov POMI (Journal of Mathematical Sciences), 399:15-31, 2012.
24. Dmitry Itsykson and Dmitry Sokolov, The complexity of inversion of explicit Goldreich's function by DPLL algorithms Zapiski Nauchnyh Seminarov POMI (Journal of Mathematical Sciences), 399:88-109, 2012. A preliminary version appeared in proceedings of CSR 2011.
25. Dmitry Itsykson and Dmitry Sokolov Lower bounds for myopic DPLL algorithms with a cut heuristic. In Proceedings of ISAAC 2011, LNCS 7074: 464-473, 2011.
26. Dmitry M. Itsykson, Structural complexity of AvgBPP. Annals of Pure and Applied Logic, 162(3): 213-223, 2010. Preliminary version appeared in proceedings of CSR 2009, LNCS 5675, pp. 155-166, 2009.
27. Edward A. Hirsch and Dmitry M. Itsykson, An infinitely-often one-way function based on an average-case assumption. Algebra and Analysis, 21(3):129-143, 2009. English translation: St. Petersburg Mathematical Journal, 21(3): 459-468, 2010. A preliminary version appeared in proceedings of WoLLIC 2008, LNCS 5110, pp. 208-217.
28. Edward A. Hirsch and Dmitry Itsykson, On optimal heuristic randomized semidecision procedures, with application to proof complexity. In Proceedings of STACS 2010, pp. 453-464, 2010.
29. Dmitry Itsykson and Arist Kojevnikov, Lower bounds of static Lovasz-Schrijver calculus proofs for Tseitin tautologies Zapiski Nauchnyh Seminarov POMI, 340:10-32, 2006 (in Russian), English translation appeared in Journal of Mathematical Sciences 145(3):4942-4952, 2007. Preliminary version appeared in proceedings of the ICALP 2006, pp. 323-334.

30. M. Alekhnovich, E. A. Hirsch, D. Itsykson, Exponential lower bounds for the running time of DPLL algorithms on satisfiable formulas. Journal of Automated Reasoning (2005) 35: 51-72. Preliminary version appeared in proceedings of ICALP 2004, LNCS 3142, 2004, pp. 84-96.