

Alexander Knop

Curriculum Vitae

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General

Name Alexander Knop
Place of birth Saint Petersburg, Russia
Date of birth 06 Mar 1991

Education

2013 – 2016 **Ph.D in Mathematics**, *St Petersburg Department of Steklov Mathematical Institute*, St Petersburg
2008–2013 **Master in Mathematics**, *St Petersburg State University*, St Petersburg
2011–2013 **Advanced Education**, *Computer Science Center*, St Petersburg

Master Thesis

Title *Circuit Lower Bounds for Heuristic MA*
Supervisors Edward A. Hirsch

Ph.D Thesis

Title *Complexity of Heuristic Computation and Interactive Protocols*
Supervisors Edward A. Hirsch

Conference Proceedings

- 2019 Sam Buss, Alexander Knop. **Strategies for Stable Merge Sorting**, Proceedings of SODA'19
- 2018 Sam Buss, Dmitry Itsykson, Alexander Knop, Dmitry Sokolov. **Reordering Rule Makes OBDD Proof Systems Stronger**, Proceedings of CCC'18
- 2017 Dmitry Itsykson, Alexander Knop, Andrey Romaschenko, Dmitry Sokolov. **On OBDD based algorithms and proof systems that dynamically change order of variables**, Proceedings of STACS'17
- 2017 Dmitry Itsykson, Alexander Knop. **Hard satisfiable formulas for splittings by linear combinations**, Proceedings of SAT'17
- 2016 Dmitry Itsykson, Alexander Knop, Dmitry Sokolov. **Complexity of distributions and average-case hardness**, Proceedings of ISAAC'16

- 2016 Alexander Golovnev, Edward Hirsch, Alexander Knop, Alexander Kulikov. **On the limits of gate elimination**, Proceedings of MFCS'16
- 2015 Dmitry Itsykson, Alexander Knop, Dmitry Sokolov. **Heuristic time hierarchies via hierarchies for sampling distributions**, Proceedings of ISAAC'15
- 2015 Alexander Knop. **Circuit Lower Bounds for Average-Case MA**, Proceedings of CSR'15

Journal Articles

- 2018 Alexander Golovnev, Edward Hirsch, Alexander Knop, Alexander Kulikov. **On the Limits of Gate Elimination**, is accepted for publication in Journal of Computer and System Sciences
- 2013 Alexander Knop. **Diophantine hierarchy**, Journal of Mathematical Sciences 188(1) (2013), pp. 59–69

Preprints

- 2018 Sam Buss, Dmitry Itsykson, Alexander Knop, Dmitry Sokolov. **Reordering Rule Makes OBDD Proof Systems Stronger**, ECCC - Electronic Colloquium on Computational Complexity, <https://eccc.weizmann.ac.il/report/2018/041/>
- 2017 Sam Buss, Alexander Knop. **Strategies for Stable Merge Sorting**, arXiv, <https://arxiv.org/abs/1801.04641>
- 2017 Dmitry Itsykson, Alexander Knop. **Hard satisfiable formulas for splittings by linear combinations**, ECCC - Electronic Colloquium on Computational Complexity, <https://eccc.weizmann.ac.il/report/2017/117/>
- 2017 Alexander Knop. **IPS-like Proof Systems Based on Binary Decision Diagrams**, ECCC - Electronic Colloquium on Computational Complexity, <https://eccc.weizmann.ac.il/report/2017/179/>
- 2017 Kamil Khadiev, Aliya Khadiev, Alexander Knop. **Exponential Separation between Quantum and Classical Ordered Binary Decision Diagrams, Reordering Method and Hierarchies**, ECCC - Electronic Colloquium on Computational Complexity, <https://eccc.weizmann.ac.il/report/2017/176/>
- 2016 Alexander Golovnev, Edward Hirsch, Alexander Knop, Alexander Kulikov. **On the limits of gate elimination**, ECCC - Electronic Colloquium on Computational Complexity, <https://eccc.weizmann.ac.il/report/2016/119/>
- 2015 Dmitry Itsykson, Alexander Knop, Dmitry Sokolov. **Complexity of distributions and average-case hardness**, ECCC - Electronic Colloquium on Computational Complexity, <http://eccc.hpi-web.de/report/2015/174/>
- 2014 Dmitry Itsykson, Alexander Knop, Dmitry Sokolov. **Heuristic time hierarchies via hierarchies for sampling distributions**, ECCC - Electronic Colloquium on Computational Complexity, <http://eccc.hpi-web.de/report/2014/178/>

Teaching Experience

- Jun 2017 **SEW Assistant Professor**, UC SAN DIEGO , San Diego, California
Linear Algebra, Introduction to Discrete Mathematics, and Combinatorics courses
- Sep 2013 – Jun 2017 **Teacher Assistant**, ST PETERSBURG ACADEMIC UNIVERSITY , St Petersburg
Math Logic, Complexity Theory, Algebra, Combinatorics, Expanders, and Graph Theory courses
- Sep 2013 – Jun 2015 **Teacher**, SCHOOL #533 , St Petersburg
Algebra and Mathematical Logic courses
- Sep 2007 – Jun 2015 **Teacher**, JUNIOR MATHEMATICAL SCHOOL , St Petersburg
Math teacher in mathematical club for talented schoolchildren

Work Experience

- since Jul 2017 **SEW Assistant Professor**, UC SAN DIEGO, San Diego, California
- Feb 2017– Jun 2017 **Junior Researcher**, ST PETERSBURG DEPARTMENT OF STEKLOV MATHEMATICAL INSTITUTE, St Petersburg
- Sep 2013– Jul 2014 **Developer**, GGA SOFTWARE, St Petersburg
- Feb 2010 – Sep 2010 **Developer**, YANDEX, St Petersburg
- Jun 2008 – Jul 2008 **Intern**, DEVEXPERTS, St Petersburg

Talks

- Aug 26 – Aug 31, 2018 Theory and Practice of Satisfiability Solving, Oaxaca, Mexico
- Jul 7 – Jul 8, 2018 Proof Complexity Workshop, FLOC 2018, Oxford, Great Britain
- Aug 22 – Aug 26, 2016 41st International Symposium on Mathematical Foundations of Computer Science (MFCS 2016), Krakow, Poland
- Dec 12 – Dec 14, 2016 The 27th International Symposium on Algorithms and Computation (ISAAC 2016), Sydney, Australia
- Jul 13 – Jul 17, 2015 The 10th International Computer Science Symposium in Russia (CSR'2015), Listvyanka, Russia
- Dec 9 – Dec 11, 2015 The 26th International Symposium on Algorithms and Computation (ISAAC 2015), Nagoya, Japan
- Dec 3, 2015 ELC Mini Workshop, Tokyo, Japan
- Mar 1 – Mar 6, 2015 20th Estonian Winter School in Computer Science (EWSCS'2015), Palmse, Estonia

Sep 23 – Sep 27, 2013	Eighth International Conference on Computability, Complexity and Randomness, Moscow, Russia
Jun 21 – Jun 23, 2013	Franco-Russian workshop on Algorithms, complexity and applications, Moscow, Russia
Jun 29 – Jul 01, 2013	CSEDays 2013, Ekaterinburg, Russia
Feb 26 – Mar 2, 2012	17th Estonian Winter School in Computer Science (EWSCS'2012), Palmse, Estonia
Feb 2 – Feb 9 2012	Winter School in Mathematics of Higher School of Economics, Moscow, Russia
Oct 1 – Nov 10 2012	Leonhard-Euler Scholarship Programme, St Petersburg School in Probability and Statistical Physics, Bielefeld, Germany

Awards

2011	Winner of contest research for students by High School of Economics
2012 – 2013	Increased Academic Scholarship
2012 – 2013	Computer science center Scholarship
2015 – 2016	Rokhlin Scholarship

Languages

Russian **Native speaker**

English **Upper-Intermediate**

Conversationally fluent