Grigory Yaroslavtsev, http://grigory.us

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RESEARCH INTERESTS

Approximation and sublinear time algorithms for big data: sparsification, summarization, private data release, property testing.

2013-2014   **Brown University ICERM**, Providence, RI.

Postdoctoral Fellow in Mathematics and Computer Science.

2010-2013   **Pennsylvania State University**, State College, PA (Joined by invitation, didn't apply to any other Ph.D. programs)

Ph.D., Thesis: "Efficient Combinatorial Techniques in Sparsification, Summarization and Testing of Large Datasets."

2008-2010   **Academic University of the Russian Academy of Sciences**, St. Petersburg, Russia

M.S. in Applied Mathematics and Physics (1st student in the pilot class, joint with Steklov Institute), GPA: 4.9/5.0.

2004-2008   **St. Petersburg State Polytechnic University**, St. Petersburg, Russia

B.S. in Physics and Technology. (1st result in the admission test for the department).

RESEARCH INTERNSHIPS

Microsoft Research, Redmond, May 2013 – August 2013.
Theory group, mentored by **Konstantin Makarychev**.
- Research in approximation algorithms for scheduling and clustering problems (with N. Devanur, K. Makarychev and D. Panigrahi).

Microsoft Research, SVC, August 2012 – October 2012.
Theory group, mentored by **Alexandr Andoni**.
- Parallel algorithms for large-scale geometric problems (with A. Andoni, A. Nikolov and K. Onak, in submission to STOC'14).

IBM Research, Almaden, May 2012 – July 2012.
Theory group, mentored by **David P. Woodruff**.
- Optimal direct-sum theorem for one-way communication complexity, showing that parallel repetition is optimal for solving multiple instances of problems, such as augmented indexing (with M. Molinaro and D. Woodruff, SODA'13).
- A communication protocol and lower bounds for computing the intersection (join) of distributed databases (with D. Woodruff, in submission to CCC'14, U.S. patent pending).

AT&T Labs — Research, May 2011 — August 2011.
Database theory group, mentored by **Graham Cormode**, **Cecilia M. Procopiuc**, **Divesh Srivastava** and **Howard Karloff**.
- Design and implementation of efficient differentially private mechanisms for linear queries (with G. Cormode, M. Procopiuc and D. Srivastava, ICDE'13)
- Approximation algorithms for finding overlapping clusters using qualitative informaion (with H. Karloff and A. Wirth, in submission).

- **Best Graduate Research Assistant at Computer Science and Engineering Department**, 2012.
- [TopCoder Open Algorithm Competition onsite finalist (Top 24 worldwide, handle "griffon")](#), 2010.
- **College of Engineering Fellowship**, 2010 — 2013.
- **University Graduate Fellowship**, 2010 — 2011.
- **Yandex personal research grant**, 2009 — 2010.
- Travel awards: ICDE'13, SODA'13, FOCS'12, STOC'12, STOC'11, ICALP'11, SAT'09.
- Diploma for coaching the best team in St. Petersburg Olympiad in Informatics and Programming for high-school students, 2008.
- 2nd place in St. Petersburg State Polytechnic University Olympiad in Mathematics, 2005.
- Best result in the admissions test for the Department of Physics and Technology in St. Petersburg State Polytechnic University, 2004.

- **Private Analysis of Graph Structure**, with Vishesh Karwa, Sofya Raskhodnikova and Adam Smith.

  ACM Transactions on Database Systems, to appear.

- **Steiner Transitive-Closure Spanners of Low-Dimensional Posets**, with Piotr Berman, Arnab Bhattacharyya, Elena Grigorescu, Sofya Raskhodnikova and David Woodruff.

  Combinatorica, to appear.

- **Approximation Algorithms for Spanner Problems and Directed Steiner Forest**, with Piotr Berman, Arnab Bhattacharyya, Konstantin Makarychev and Sofya Raskhodnikova.

  Information and Computation, special issue for ICALP'11. Volume 222, 2013, pp. 93-107.

- [New upper bounds on the Boolean Circuit Complexity of Symmetric Functions](#), with Eugeny Demenkov, Arist Kojevnikov and Alexander Kulikov.

  Information Processing Letters, 110, pp. 264-267, Elsevier, 2010.

- **Parallel Algorithms for Geometric Graph Problems**, with Alexandr Andoni, Krzysztof Onak and Aleksandar Nikolov.

  In submission to the 46th ACM Symposium on the Theory of Computing, (STOC 2014). Draft: [PDF](#). Tech report: [ArXiv:1401.0042](#).

- **Testing with Respect to L_p Distances**, with Piotr Berman and Sofya Raskhodnikova.

  In submission to the 46th ACM Symposium on the Theory of Computing, (STOC 2014). Draft: [PDF](#).

- **The Communication Complexity of Certifying Equality and Finding the Intersection**, with Joshua Brody, Amit Chakrabarti, Ranganath Kondapally and David Woodruff.

  In submission to the 29th IEEE Conference on Computational Complexity, (CCC 2014). Draft: [PDF](#).

- **Lower Bounds for Testing Properties of Functions over Hypergrid Domains**, with Eric Blais and Sofya Raskhodnikova.

  In submission to the 29th IEEE Conference on Computational Complexity, (CCC 2014). Draft: [PDF](#). Tech report: [ECCC TR13-036](#).

- **Correlation Clustering with Overlaps**, with Howard Karloff and Anthony Wirth.

  In submission. Draft: [PDF](#).

CONFERENCE PAPERS	• [1]**Accurate and Efficient Private Release of Datacubes and Contingency Tables**. Grigory Yaroslavtsev, Graham Cormode, Cecilia M. Procopiuc and Divesh Srivastava.
	29th IEEE International Conference on Data Engineering (ICDE 2013). Available as ArXiv:1207.6096.
	• **Beating the Direct Sum Theorem in Communication Complexity with Implications for Sketching**, with Marco Molinaro and David Woodruff.
	24th Annual ACM-SIAM Symposium on Discrete Algorithms (SODA 2013).
	• **Learning Pseudo-Boolean k-DNF and Submodular Functions**, with Sofya Raskhodnikova.
	24th Annual ACM-SIAM Symposium on Discrete Algorithms (SODA 2013).
	• **Primal-dual algorithms for Node-Weighted Network Design in Planar Graphs**, with Piotr Berman.
	15th International Workshop on Approximation Algorithms for Combinatorial Optimization Problems (APPROX 2012).
	• **Private Analysis of Graph Structure**, with Vishesh Karwa, Sofya Raskhodnikova and Adam Smith.
	37th International Conference on Very Large Data Bases (VLDB 2011), Research track.
	• **Improved Approximation for the Directed Spanner Problem**, with Piotr Berman, Arnab Bhattacharyya, Konstantin Makarychev and Sofya Raskhodnikova.
	38th International Colloquium on Automata, Languages and Programming (ICALP 2011), Track A.
	Runner-up for the Best Paper Award, invited to a special issue of a journal "Information and Computation".
	• **Steiner Transitive-Closure Spanners of Low-Dimensional Posets**, with Piotr Berman, Arnab Bhattacharrya, Elena Grigorescu, Sofya Raskhodnikova and David Woodruff.
	38th International Colloquium on Automata, Languages and Programming (ICALP 2011), Track A.
	• **Finding Efficient Circuits using SAT-solvers**, with Arist Kojevnikov and Alexander Kulikov.
	12th International Conference on Theory and Applications of Satisfiability Testing (SAT 2009), LNCS 5584, pp. 32-44, 2009.
RESEARCH VISITS	• Microsoft Research, Redmond. 01/08/14–01/12/14. (Host: Konstantin Makarychev)
	• IBM T.J. Watson Research Center, Yorktown Heights, NY. 04/19/11–04/21/11, 11/13/12–11/15/12. (Hosts: Konstantin Makarychev, Vishwanath Nagarajan)
	• AT&T Labs – Research, Florham Park, NJ. 11/18/11–11/25/11. (Host: Howard Karloff)
	• Weizmann Institute of Science, Rehovot, Israel. 12/27/12–01/04/13. (Host: Robert Krauthgamer)
	• University of Melbourne, Australia. 04/12/13–04/20/13. (Host: Anthony Wirth)
	• Aarhus University, Denmark. 05/17/13–05/25/13. (Host: Joshua Brody)
LONG TALKS + POSTERS	• Testing Properties Under L_p Distances
	• Microsoft Research, Redmond. Theory Lunch. January 2014.

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[1]This is the only paper with non-alphabetical ordering of authors

- Harvard University, Boston, MA. Theory Seminar. November 2013.
- Brown University, Providence RI. Theory Seminar. November 2013.
- IBM Almaden Research Center, San Jose, CA. October 2013.
- Property Testing and Communication Complexity
  - MIT, Boston, MA. Algorithms and Complexity seminar. September 2013.
- Accurate and Efficient Private Release of Data Cubes and Contingency Tables
  - Cornell University, CDI project meeting. May 2013.
- Beating the Direct Sum in Communication Complexity with Implications for Sketching.
  - Aarhus University, Denmark. Theory seminar. May 2013.
  - MIT, Boston, MA. Algorithms and Complexity seminar. December 2012.
  - Princeton University, Princeton, NJ. Theory lunch. November 2012.
  - FOCS 2012, Rutgers University, NJ. Poster session. October 2012.
- Overlapping Clustering with Qualitative Information
  - FOCS 2012, Rutgers University, NJ. Poster session. October 2012.
- Parallel Algorithms for Geometric Problems
  - Microsoft Research SVC, Mountain View, CA. Group meeting. October 2012.
  - FOCS 2012, Rutgers University, NJ. Poster session. October 2012.
- Learning and Testing Submodular Functions.
  - Microsoft Research, Redmond. Theory seminar. June 2013.
  - University Of Melbourne, Theory seminar, April 2013.
  - UCLA, Los Angeles, LA. Theory seminar. February 2013.
  - Weizmann Institute of Science, Rehovot, Israel. Theory seminar. December 2012.
  - New York Computer Science and Economics Day (NYCE), New York, NY. Poster session. December 2012.
  - Harvard University, Boston, MA. Theory seminar. December 2012.
  - Carnegie-Mellon University, Pittsburgh, PA. Theory lunch, December 2012.
  - Carnegie-Mellon University, Pittsburgh, PA. OR seminar. December 2012.
  - IBM T.J. Watson Research Center, Yorktown Heights, NY. IP for lunch. November 2012.
  - Columbia University, New York, NY. October 2012.
  - FOCS 2012, Rutgers University, NJ. Poster session. October 2012.
  - Microsoft Research SVC, Mountain View, CA. Theory seminar. October 2012.
  - EPFL, Lausanne, Switzerland. Algorithmic Frontiers Workshop, poster session. June 2012.
  - STOC 2012, New York, NY. Poster session. May 2012.
  - IBM Almaden Research Center, San Jose, CA. Theory seminar. May 2012.
- [Advances in Directed Spanners](#).
  - University of Sydney, Theory seminar, April 2013.
  - Carnegie-Mellon University, Theory Lunch, November 2011.
  - University of Maryland, Capital Area Theory Seminar, November 2011.
- [Private Analysis of Graph Structure](#)
  - EPFL, Lausanne, Switzerland. Algorithmic Frontiers Workshop, poster session. June 2012.
  - AT&T Labs — Research, Florham Park, NJ. August 2011.
- Introduction to Property Testing
  - St. Petersburg Department of V.A. Steklov Institute of Mathematics of the Russian Academy of Sciences. December 2012.
  - St. Petersburg Institute of Fine Mechanics and Optics. Theory seminar. December 2012.
- [Introduction to Differential Privacy](#) (based on slides by Adam D. Smith).
  - St. Petersburg Department of Steklov Institute of Mathematics, Computer Science club, May 2011.
- Property Testing and Communication Complexity
  - Moscow State University. Kolmogorov seminar. May 2011.
- [Improved Approximation for the Directed Spanner Problem](#)
  - AT&T Labs — Research, Florham Park, NJ. Mathematics Research Colloquium and

Informal Seminar. June 2011.
- Princeton, NJ, June 2011. Workshop on Approximation Algorithms, Open Problem Session: [Slides], [Notes by Rajesh Chitnis].
- STOC 2011, San Jose, CA. Poster session. June 2011.
- Moscow State University. Combinatorial optimization seminar. May 2011.
- IBM T.J. Watson Research Center, Yorktown Heights, NY. IP for lunch. April 2011.
- St. Petersburg Institute of Fine Mechanics and Optics. Theory seminar. December 2010.

- Linear bounds on circuit complexity and feebly one-way permutations
  - Pennsylvania State University, State College, PA. Theory seminar. April 2010.

PATENTS

- "A Communication and Message-Efficient Protocol for Computing the Intersection Between Different Sets of Data", with David P. Woodruff. U.S. patent pending. IBM Almaden Research Center, San Jose, CA.

SERVICE

Organized Theory Seminar at Brown CS Department (2013 – 2014).

PC member for "Graph Theory and Applications" CSEDays 2012, Ekaterinburg, Russia.

Reviewer for:
- Journals: SIAM Journal on Computing (SICOMP), SIAM Journal on Discrete Mathematics (SIDMA), Information and Computation (I&C), IEEE Transactions on Knowledge and Data Engineering (TKDE), Theory of Computing (ToC).
- Conferences: FOCS'13, MFCS'13, ICALP'13, SODA'13, APPROX'12, FOCS'12, COCOA'12, SWAT'12, SODA'12, VLDB'12, WADS'11, MFCS'10, SAT'10.

Organized a theory reading group at Penn State:
- Spring 2013: "Computer Science for the Information Age", based on an eponimous book by John Hopcroft and Ravi Kannan.
- Fall 2011: Selected lectures from classes Analysis of Boolean Functions by Ryan O'Donnell and The PCP Theorem and Hardness of Approximation by Venkatesan Guruswami and Ryan O'Donnell at CMU.
- Spring 2011: "A Theorist's Toolkit", based on notes for a class taught by Sanjeev Arora at Princeton.

Extracurricular education for high-school students:
- Prepared training contests for the United States team in International Olympiad in Informatics 2011.
- Co-founder and coordinator of St. Petersburg network of extracurricular education in informatics for high-school students (http://spbtc.ru) (2009-2010).
- Judge for Baltic Science and Engineering Contest (Intel ISEF semifinals), 2010.

PROFESSIONAL   ACM SIGACT, IEEE
MEMBERSHIP

TECHNICAL   C/C++, STL, Java, Windows/Linux, LaTeX, CPlex/Gurobi/AMPL.
SKILLS