

Curriculum Vitae

Dmitrii V. PASECHNIK

Address and present positions Lecturer, Department of Computer Science
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Citizenship: Netherlands
Marital status: married, one child, born 31/08/2012

Degrees: Diploma in computer science
Moscow National University of Science and Technology (MISIS) (1989)

PhD in Mathematics (with Distinction),
the University of Western Australia (1996)

Research interests

Algebra, Algebraic Geometry, Combinatorics,
Graph Theory, Group Theory (including computational).
Computer Algebra, Scientific Computation, Computational Complexity,
Optimization (nonlinear and linear) and its applications, moment problems

I contribute to the development and maintainance of the computer algebra systems Sage (<http://www.sagemath.org>) and GAP (<http://www.gap-system.org>) (as well as the related systems and packages), and use these systems for research and teaching. I was a Google Summer of Code (GSoC) mentor for Sage Project organization in 2012-2018, and a mentor+admin in 2018-2020.

Grants

NTU SPMS Faculty Startup Grant	42,000\$\$	(Apr. 2006-Mar. 2009)
Merlion Grant by the Embassy of France PI on Singaporean side of the project	40,000\$\$	(Aug. 2008-Aug. 2010)
Singapore Ministry of Education Tier 1 Grant,	60,000\$\$	(Apr. 2009-Mar. 2012)
Singapore Ministry of Education Tier 2 Grant,	658,000\$\$	(Nov. 2011-Oct. 2014)
Institute for Mathematical Sciences (IMS), National University of Singapore, thematic 2.5-month program on inverse moment problems	130,000\$\$ co-organiser	(Nov. 2013-Jan. 2014)
NTU Senior Reseach Scientist Grant	400,000\$\$	(Jan. 2013-Jan. 2017)
EPSRC (EP/M022641/1) CCP in Computational Discrete Mathematics	294,007 £ named person	(Mar. 2015-Feb. 2020) travel funding, etc
EU Horizon 2020 Research Infrastructures Grant OpenDreamKit: http://opendreamkit.org	75% salary	(Oct. 2015-Aug. 2019)
Google Cloud Platform credits	5,000\$US	(Sept. 2018-Feb. 2019)
Total		(approx. 1.1M€)

Citations

According to Google Scholar, my papers and preprints were cited **1953** times; top two papers (published in 2002 and 2007) received 322 and 131 citations, respectively; current *h*-index is **22**.

According to MathSciNet (American Math. Soc.), my papers (74) were cited **558** times. This information is available at <https://mathscinet.ams.org/mathscinet/search/author.html?mrauthid=292421>

According to Scopus, my papers (72) were cited (excluding self-citations and co-author citations) 652 times, and the *h*-index is 13.

Positions held:

1982-1983	Software Engineer, Computing Center of the Health Ministry of the USSR,
1989-1992	Engineer, Laboratory of Discrete Mathematics Institute for System Studies Academy of Sciences of the USSR.
1992-1994	PhD Research Student and part-time tutor, Department of Mathematics University of Western Australia
1994-1996	Research fellow, Research Institute for Applications of Computer Algebra (RIACA) CWI Amsterdam/TU Eindhoven, The Netherlands
04/1997–03/1999	Postdoc, SSOR, Faculty of Technical Mathematics TU Delft, The Netherlands
04/1999–04/2000	Scientific programmer (ESPRIT EU project GALIA/CGAL), Dept. of Computer Science, Faculty of Mathematics and Informatics Utrecht University, The Netherlands
04/2000–04/2002	Postdoc, SSOR, Dept. of Technical Mathematics and Informatics TU Delft, The Netherlands
05/2002–07/2004	Scientific researcher, Theoretic Informatics Group, FB 20, University Frankfurt/Main, Germany
09/2004–12/2005	Research fellow, Dept. E & OR, FEB Tilburg University, The Netherlands
01/2006–09/2013	Assistant Professor, Division of Mathematical Sciences Nanyang Technological University, Singapore
10/2013–08/2019	Senior Research Fellow, Department of Computer Science The University of Oxford, UK
09/2019–02/2020	Research software engineer, Department of Computer Science University of St. Andrews, UK
10/2014–09/2020	Stipendiary Lecturer in Mathematics & Senior Research Fellow (part-time) Pembroke College, University of Oxford, UK

Undegraduate teaching

At NTU

Calculus IV	(Spring 2006)	class size 10
Real Analysis I	(Autumn 2007)	class size 12
Abstract Algebra I	(Spring 2007-2009)	class sizes 10-20
Real Analysis III	(Autumn 2008)	class size 5
Topology	(Autumn 2007, 2008)	class size 6-8
Graph Theory	(Autumn 2009-2010)	class size 8-10
Deterministic Methods in OR (Optimization II)	(Spring 2010–2012)	class size 5-6
Experimental Mathematics	(Autumn 2011)	class size 120
Tutorials/labs in Linear Algebra and Calculus	(multiple years)	class sizes 20-30

At Pembroke College (Oxford)

Tutorial sessions for groups 2 to 4 students, classes for 8-10 students.

Various 1st-2nd year Maths tutorials (2014–2020)

At Balliol College (Oxford)

Tutorial sessions for groups 2 to 4 students.

Constructive Maths (TT 2014)
Continuous Maths (HT 2015,2016)

At Mathematics Institute (Oxford)

Assessor (designed course materials) for Computational Mathematics 1st year course, 2016-17.

Graduate teaching (at NTU)

Seminar on Computational Commutative Algebra (Autumn 2007) class size 10
Algebra I (Spring 2007) class size 10
Representation Theory (Spring 2011) class size 12
Introduction to Algebraic Geometry (Fall 2012) class size 10

(Post)graduate supervision

Postdoctoral:

Romanos Malikiosis (January 2012 - August 2013)
Nikolai (Nick) Gravin (November 2012 - August 2012)
Mehdi Ghasemi (February 2013 - January 2014).

Supervised PhD students:

Svetlana Obraztsova (co-supervised with Edith Elkind; started in August 2008, defended the thesis in October 2012).
Nick Gravin (started in January 2009, defended the thesis in June 2013.)
Gao Mou (started in August 2012, defended the thesis in January 2016).

Supervised MSc students:

Alexey Beshenov, (remotely) at the Russian Academy of Sciences University at St.Petersburg (degree granted in 2012).
Ingólfur Eðvarðsson (MSc in CS, Oxford) (degree granted in 2014).
Dario Asprone (MSc in CS, Oxford) (degree granted in 2018).
Kaashif Hymabaccus (Maths and CS, Oxford) (2018-2019, 1st class degree granted in 2019).
Ivo Maffei (Maths and CS, Oxford) (2019-2020, thesis submitted)

Scholarships and visiting positions

Australian Overseas Postgraduate Research Scholarship	(1992-1994)
University of Western Australia Research Studentship	(1992-1994)
C.N.R. Visiting Professor, Univ. L'Aquila/Univ. Siena, Italy	(March 1996)
Visiting Professor, Ecole Normale Sup., Paris, France	(April-May 2000)
Visiting Professor, IRMAR, Univ. Rennes I, France	(March 2003)
General Member (fully funded), MSRI, Berkeley, USA	(January-April 2004)
Visiting Professor, Math. Dept., Univ. Brest, France	(June 2005)
Visiting Professor, IRMAR, Univ. Rennes I, France	(June-July 2006)
General Member (funded), IMA, Univ. of Minnesota, USA	(May-June 2007)
Visiting Professor, IRMAR, Univ. Rennes I, France	(June 2009)
Visiting Fellow, Isaac Newton Institute, Cambridge, UK	(July/August 2013)
Visiting Fellow, Simons Institute, Berkeley, USA	(August/October 2015)
Visiting Professor, LRI, Univ. Paris Sud, France	(November/December 2017)
Visiting Fellow, ICERM, Brown University, USA	(November 2018)

Other professional activities

Editorships. *Communications in Mathematics* (Sciencd/De Gruyter), member of the editorial board.

Program Committee memberships. AAMAS 2011, IJCAI 2011.

Organizing Committee memberships. WINE 2011, IMS (Singapore) Thematic program on inverse moment problems, 2012/13, (Co-Chair).

Grant refereeing. MITACS (a Canadian funding agency), AMS/NSA Grant Program in Mathematical Sciences (USA), Portuguese Foundation for Science and Technology (FCT), NWO (Dutch science funding agency), Research Grants Council (RGC, Hong Kong).

PhD theses examiner. University of Rennes I (France), NTU (Singapore), University of Birmingham (UK), University Paris Sud (France).

MSc theses examiner. University of Oxford, Nanyang Technological University.

Journal refereeing. European Journal of Combinatorics, Journal of Algebraic Combinatorics, Journal of Computational and Applied Mathematics, Applicable Algebra in Engineering, Communication and Computing, Combinatorica, Advances in Mathematics, Communications in Algebra, Discrete Mathematics, Discrete Applied Mathematics, Discrete and Computational Geometry, Mathematical Programming, SIAM Journal on Optimization, Theoretical Computer Science, Journal of Global Optimization, Graphs and Combinatorics, Journal of Group Theory, Designs, Codes, and Cryptography.

Membership in professional societies: London Mathematical Society (LMS). European Mathematical Society (EMS).

Other professional activities: I am active (also as a moderator) on Mathoverflow (<https://mathoverflow.net>) where I have top 3% reputation (over 11.5K).

Administrative work (at NTU)

- Member of NTU Senate Sub-Committee on Technology Empowered Learning Infrastructure for Classroom of Tomorrow (2008–2010).
- NTU Division of Mathematical Sciences coordinator for the undergraduate student exchange programs (2007–2012).
- NTU Division of Mathematical Sciences undergraduate classes timetables coordinator (2008).

Computing and IT skills

General-purpose programming languages and tools:

Working knowledge of: Python, C, C++, Fortran

Unix shells and make, m4, autotools (autoconf/automake), Git and Mercurial.

Some experience with: Jupyter, Julia, Lisps (Scheme and CL), Haskell, Javascript, cmake, CVS and Subversion, database programming, coq.

Working knowledge of CASs: Sage/Sagemath, GAP, Mathematica, Maple, Matlab, Singular, Maxima, Macaulay2. Detailed knowledge of $\text{T}_{\text{E}}\text{X}/\text{L}_{\text{A}}\text{T}_{\text{E}}\text{X}$, including preparation of $\text{L}_{\text{A}}\text{T}_{\text{E}}\text{X}$ packages.

Other IT skills: basic knowledge of and experience with Linux and BSD system administration, web pages and applications, continuous integration tools such as Travis CI, HTML/CSS, Javascript, Jupyter, Windows and Cygwin (a Windows POSIX emulator), MacOS, Solaris, HP/UX.

Journal articles

- [1] Kaashif Hymabaccus and Dmitrii V. Pasechnik. “RepnDecomp: A GAP package for decomposing linear representations of finite groups”. In: *Journal of Open Source Software* 5.50 (2020), pp. 1835–1836. DOI: 10.21105/joss.01835.
- [2] Pauli Virtanen et al. “SciPy 1.0—Fundamental Algorithms for Scientific Computing in Python”. In: *Nature Methods* 17 (Mar. 2020). Dmitrii V. Pasechnik is one of the *Contributors*, see p.272, pp. 261–272. DOI: 10.1038/s41592-019-0686-2. arXiv: 1907.10121 [cs.MS].
- [3] Y. Bachrach, E. Elkind, E. Malizia, R. Meir, D.V. Pasechnik, M. Zuckerman, J. Rothe, and J. Rosenschein. “Bounds on the Cost of Stabilizing a Cooperative Game”. In: *Journal of AI Research* 63 (2018), pp. 987–1023. DOI: 10.1613/jair.1.11270.
- [4] N. Gravin, D.V. Pasechnik, B. Shapiro, and M. Shapiro. “On moments of a polytope”. In: *Analysis and Mathematical Physics* 8 (2018). arXiv.org e-print math 1210.3193, pp. 255–287. URL: <https://rdcu.be/LqSA>.
- [5] D. V. Pasechnik. “Locally toroidal polytopes of rank 6 and sporadic groups”. In: *Advances in Mathematics* 312 (2017), pp. 459–472. DOI: 10.1016/j.aim.2017.03.029.
- [6] V. L. Ginzburg and D. V. Pasechnik. “Random Chain Complexes”. In: *Arnold Mathematical Journal* 3 (2017), pp. 197–204. DOI: 10.1007/s40598-016-0062-6. eprint: 1602.08538 (math.CO).
- [7] N. Cohen and D. V. Pasechnik. “Implementing Brouwer’s database of strongly regular graphs”. In: *Designs, Codes, and Cryptography* 84 (2017), pp. 223–235. DOI: 10.1007/s10623-016-0264-x.
- [8] G. Mou and D. Pasechnik. “Edge-dominating cycles, k -walks and Hamilton prisms in $2K_2$ -free graphs”. In: *J. Knot Theory and its Ramifications* 25 (2016), pp. 1–9. DOI: 10.1142/S0218216516420116.
- [9] S. Margulies, S. Onn, and D. V. Pasechnik. “On the complexity of Hilbert refutations for partition”. In: *J. Symbolic Comput.* 66 (2015), pp. 70–83. ISSN: 0747-7171. DOI: 10.1016/j.jsc.2013.06.005.
- [10] Chan Swee Hong, H. Hollmann, and D.V. Pasechnik. “Sandpile groups of generalized de Bruijn and Kautz graphs and circulant matrices over finite fields”. In: *Journal of Algebra* 421 (2015). arXiv.org e-print math 1405.0113, pp. 268295. DOI: 10.1016/j.jalgebra.2014.08.029.
- [11] D.V. Pasechnik and B. Shapiro. “On polygonal measures with vanishing harmonic moments”. In: *Journal d’Analyse Mathématique* 123.1 (2014). arXiv.org e-print math 1209.4014, pp. 281–301. DOI: 10.1007/s11854-014-0021-x.
- [12] D. Bremner, M. Dutour Sikirić, D.V. Pasechnik, T. Rehn, and A. Schürmann. “Computing symmetry groups of polyhedra”. In: *LMS Journal of Computation and Mathematics* 17 (2014). arXiv.org e-print math 1210.0206, pp. 565–581.
- [13] S. Duzhin and D.V. Pasechnik. “Automorphisms of necklaces and sandpile groups”. In: *Notes of Scientific Seminars of the St.Petersburg Department of the Steklov Mathematical Institute* 421 (2014). arXiv.org e-print 1304.2563, pp. 81–93. URL: <ftp://ftp.pdmi.ras.ru/pub/publicat/zns1/v421/p081.pdf>.
- [14] S.V. Duzhin and D.V. Pasechnik. “Groups Acting on Necklaces and Sandpile Groups”. English. In: *Journal of Mathematical Sciences* 200.6 (2014). originally published as [13], pp. 690–697. ISSN: 1072-3374. DOI: 10.1007/s10958-014-1960-6.

- [15] E. de Klerk, D. V. Pasechnik, and G. Salazar. “Book drawings of complete bipartite graphs”. In: *Discrete Applied Mathematics* 167 (2014). arXiv.org e-print math 1210.2918, pp. 80–93. DOI: 10.1016/j.dam.2013.11.001.
- [16] M.F. Ezerman, Somphong Jitman, San Ling, and D.V. Pasechnik. “CSS-like Constructions of Asymmetric Quantum Codes”. In: *IEEE Transactions on Information Theory* 59.10 (2013). arXiv.org e-print cs 1207.6512, pp. 6732–6754.
- [17] E. de Klerk, D. V. Pasechnik, and G. Salazar. “Improved lower bounds for book crossing numbers of complete graphs”. In: *SIAM Journal on Discrete Mathematics* 27 (2013). arXiv.org e-print math 1207.5701, pp. 619–633. DOI: 10.1137/120886777.
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- [19] E. de Klerk and D.V. Pasechnik. “Improved lower bounds for the 2-page crossing numbers of $K_{m,n}$ and K_n via semidefinite programming”. In: *SIAM Journal on Optimization* 22 (2012), pp. 581–595. URL: <http://arxiv.org/abs/1110.4824>.
- [20] N. Gravin, J.B. Lasserre, D.V. Pasechnik, and S. Robins. “The inverse moment problem for convex polytopes”. In: *Discrete and Computational Geometry* 48.3 (2011), pp. 596–621. URL: <http://arxiv.org/abs/1106.5723>.
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- [22] E. de Klerk, C. Dobre, and D. V. Pasechnik. “Numerical block diagonalization of matrix *-algebras with application to semidefinite programming”. In: *Mathematical Programming B* 129.1 (2011). e-print 2009-02-2244 at Optimization online, pp. 91–111. DOI: 10.1007/s10107-011-0461-3.
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- [25] S. Basu, D.V. Pasechnik, and M.-F. Roy. “Bounding the Betti numbers and computing the Euler-Poincare characteristic of semi-algebraic sets defined by partly quadratic systems of polynomials”. In: *Journal of European Mathematical Society* 12 (2010). arXiv.org preprint math.AG/0708.3522, pp. 529–553. DOI: 10.4171/JEMS/208.
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- [37] E. de Klerk, D. V. Pasechnik, and J. P. Warners. “On approximate graph colouring and MAX- k -CUT algorithms based on the ϑ -function”. In: *J. Comb. Optim.* 8.3 (2004), pp. 267–294. ISSN: 1382-6905.
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- [50] Alberto Del Fra, Dmitrii V. Pasechnik, and Antonio Pasini. “A new family of extended generalized quadrangles”. In: *European J. Combin.* 18.2 (1997), pp. 155–169. ISSN: 0195-6698.
- [51] Dmitrii V. Pasechnik. “The extensions of the generalized quadrangle of order $(3, 9)$ ”. In: *European J. Combin.* 17.8 (1996), pp. 751–755. ISSN: 0195-6698.
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- [53] Hans Cuypers, Anna Kasikova, and Dmitrii V. Pasechnik. “Multiple extensions of generalized hexagons related to the simple groups McL and Co_3 ”. In: *J. London Math. Soc. (2)* 54.1 (1996), pp. 16–24. ISSN: 0024-6107.
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- [58] Dmitrii V. Pasechnik. “Extended generalized octagons and the group He”. In: *Geom. Dedicata* 56.1 (1995), pp. 85–101. ISSN: 0046-5755.
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