

N. VOROBJOV
PUBLICATIONS

1. On a theorem of Bonnenblust, Karlin and Shapley, *Notes of Leningrad University*, **13**, 3, 1980, 45–48 (in Russian).
2. Zero-sum two person games with convex pay-off, in: *Math. Methods in Systems, Kalinin State University*, 1980, 68–78 (in Russian).
3. On the complexity of deciding stability in graphs, in: *Games and their Applications, Kalinin State University*, 1982, 131–140 (in Russian).
4. Exponential complexity of Sperner’s algorithm for diadic non-cooperative games, *Math. Methods in Social Sci.*, **17**, Acad.Sci. of Lithuania, 1984, 5–21 (in Russian).
5. Estimates of real roots of a system of algebraic equations, *Notes of Sci. Seminars of Leningrad Dept. of Math. Steklov Inst.* **137**, 1984, 7–20 (English translation in: *J. Soviet Math.*, **34**, 4, 1986, 1754–1762).
6. Finding real solutions of systems of polynomial inequalities in subexponential time, *Doklady of Acad. Sci. USSR*, **283**, 6, 1985, 1561–1565 (English translation in: *Soviet Math. Dokl.*, **32**, 1, 1985, 316–320). With D. Grigoriev.
7. *Qualitative Analysis of Control Processes*, Leningrad University Press, 1987, 188 p. (in Russian). With I.V.Zubov.
8. Solving systems of polynomial inequalities in subexponential time, *J. Symbolic Comp.*, **5**, 1988, 37–64. Reprinted in: *Algorithms in Real Algebraic Geometry*, London: Academic Press, 1989. With D. Grigoriev.
9. Solving systems of polynomial inequalities over real close fields in subexponential time, *Notes of Sci. Seminars of Leningrad Dept. of Math. Steklov Inst.*, **174**, 1988, 3–37 (English translation in: *J. Soviet Math.*, **55**, 2, 1991, 1519–1541). With D. Grigoriev.
10. Deciding consistency of systems of polynomial in exponent inequalities in subexponential time, *Notes of Sci. Seminars of Leningrad Dept. of Math. Steklov Inst.*, **176**, 1989, 7–40 (English translation in: *J. Soviet Math.*, **59**, 3, 1992, 1322–1360).
11. Counting connected components of a semialgebraic set in subexponential time, *Doklady of Acad. Sci. USSR*, **314**, 5, 1990, 3455–3460, (English translation in: *Soviet Math. Dokl.*, **42**, 2, 1991, 563–566). With D. Grigoriev.
12. Comptage des composantes connexes d’un ensemble semi-algebrique en temps simplemment exponentiel, *C.R. Acad. Sci. Paris*, **311**, Serie I, 1990, 879–882. With D. Grigoriev, J. Heintz, M.-F. Roy, P. Solerno.

13. Deciding consistency of systems of polynomial in exponent inequalities in subexponential time, in: *Effective Methods in Algebraic Geometry*, Progress in Mathematics, **94**, Boston: Birkhauser, 1991, 491–500.
14. Computing connected components of semialgebraic sets in subexponential time, *Notes of Sci. Seminars of Leningrad Dept. of Math. Steklov Inst.*, **192**, 1991, 3–40 (English translation in: *J. of Math. Sci.*, **70**, 4, 1994, 1847–1872). With D. Grigoriev.
15. The complexity of deciding consistency of systems of polynomial in exponent inequalities, *J. Symbolic Comp.*, **13**, 1992, 139–173.
16. Finding connected components of a semialgebraic set in subexponential time, *Applic. Algebra Eng. Commun. Comput.*, **2**, 1992, 217–238. With J. Canny, D. Grigoriev.
17. Counting connected components of a semialgebraic set in subexponential time, *Computational Complexity*, **2**, 1992, 133–186. With D. Grigoriev.
18. Effective stratification of regular real algebraic varieties, in: *Real Algebraic Geometry. Proceedings of the conference held at Rennes, France, 1991*, Springer Lecture Notes in Math., **1524**, 1992, 402–415.
19. Lower bounds on testing membership to a polyhedron by algebraic decision trees, *Proceedings of 1994 ACM Symposium on Theory of Computing (STOC)*, 1994, 635–644. With D. Grigoriev, M. Karpinski.
20. Finding irreducible components of some real transcendental varieties, *Computational Complexity*, **4**, 1994, 107–132. With M.-F. Roy.
21. Complexity lower bounds for computation trees with elementary transcendental function gates, *Proceedings of 1994 IEEE Symposium on Foundations of Computer Science (FOCS)*, 1994, 548–552. With D. Grigoriev.
22. Complexity of stratifications of semi-Pfaffian sets, *Discrete and Computational Geometry*, **14**, 1995, 71–91. With A. Gabrielov.
23. Complexity of finding irreducible components of a semialgebraic set, *Journal of Complexity*, **11**, 1995, 174–193. With A. Galligo.
24. Improved lower bound on testing membership to a polyhedron by algebraic decision trees, *Proceedings of 1995 IEEE Symposium on Foundations of Computer Science (FOCS)*, 1995, 258–265. With D. Grigoriev, M. Karpinski.
25. Complexity lower bounds for computation trees with elementary transcendental function gates, *Theoretical Computer Science*, **157**, 1996, 185–214. With D. Grigoriev.
26. Computing complexification of a semialgebraic set, *Proceedings of 1996 International Symposium on Symbolic and Algebraic Computation (ISSAC)*, ACM Press, 1996, 26–34. With M.-F. Roy.
27. Lower bound on testing membership to a polyhedron by algebraic decision and computation trees, *Discrete and Computational Geometry*, **17**, 2, 1997, 191–215. With D. Grigoriev, M. Karpinski.

28. Motion planning of an N -joint planar mechanism: A non-heuristic approach, *JSME International Journal, Series C*, **40**, 1, 1997, 112–119. With R. Sinatra, E. Guglielmino.
29. Computing local dimension of a semialgebraic set, *Proceedings of 1998 ACM Symposium on Theory of Computing (STOC)*, 1998, 483–487.
30. Complexity of computing the local dimension of a semialgebraic set, *J. Symbolic Comp.*, **27**, 1999, 565–579.
31. Bounds on numbers of vectors of multiplicities for polynomials which are easy to compute, *Proceedings of 2000 International Symposium on Symbolic and Algebraic Computation (ISSAC)*, ACM Press, 2000, 137–145. With D. Grigoriev.
32. Complexity of cylindrical decompositions of sub-Pfaffian sets, *J. Pure and Appl. Algebra*, **164**, 1–2, 2001, 179–197. With A. Gabrielov.
33. New complexity bounds for cylindrical decompositions of sub-Pfaffian sets, *Proceedings of 2001 International Symposium on Symbolic and Algebraic Computation (ISSAC)*, ACM Press, 2001, 268–275. With S. Pericleous.
34. Complexity of Null- and Positivstellensatz Proofs, *Ann. Pure and Appl. Logic*, **113**, 1–3, 2002, 153–160. With D. Grigoriev.
35. The complexification and degree of a semialgebraic set, *Mathematische Zeitschrift*, **239**, 1, 2002, 131–142. With M.-F. Roy.
36. New complexity bounds for cylindrical decompositions of sub-Pfaffian sets, in: *Discrete and Computational Geometry. Goodman-Pollack Festschrift*, B. Aronov et al. (Eds.), Springer, 2003, 673–694. With S. Pericleous.
37. Betti numbers of semialgebraic and sub-Pfaffian sets, *J. London Math. Soc.*, **69**, part 1, 2004, 27–43. With A. Gabrielov, T. Zell.
38. Complexity of computations with Pfaffian and Noetherian functions, in: *Normal Forms, Bifurcations and Finiteness Problems in Differential Equations*, Yu. Ilyashenko et al. (Eds.), NATO Science Series II, **137**, Kluwer, 2004, 211–250. With A. Gabrielov.
39. Pfaffian hybrid systems, in: *Computer Science Logic(CSL)'04*, Springer Lecture Notes in Comp. Sci., **3210**, 2004, 430–441. With M. Korovina.
40. Betti numbers of semialgebraic sets defined by quantifier-free formulae, *Discrete and Computational Geometry*, **33**, 3, 2005, 395–401. With A. Gabrielov.
41. On the number of homotopy types of fibres of a definable map, *J. London Math. Soc.*, **76**, part 3, 2007, 757–776. With S. Basu.
42. Bounds on sizes of finite bisimulations of Pfaffian dynamical systems, *Theory Comput. Systems*, **43**, 2008, 498–515. With M. Korovina.
43. Approximation of definable sets by compact families, and upper bounds on homotopy and homology, *J. London Math. Soc.*, **80**, 2, 2009, 35–54. With A. Gabrielov.

44. Semi-monotone sets, *J. European Math. Soc.*, **15**, 2, 2013, 635–657.
With S. Basu, A. Gabrielov.
45. Reachability in one-dimensional controlled polynomial dynamical systems, Springer Lecture Notes in Comp. Sci., **7162**, 2012, 251–261.
With M. Korovina.
46. Monotone functions and maps, *Revista de la Real Academia de Ciencias Exactas, Fisicas y Naturales. Serie A. Matematicas (RACSAM)*, **107**, 1, 2013, 5–33. With S. Basu, A. Gabrielov.
47. A Helly-type theorem for semi-monotone sets and monotone maps, *Discrete and Computational Geometry*, **50**, 4, 2013, 857–864.
With S. Basu, A. Gabrielov.
48. Toric cubes are closed balls, preprint, arXiv:1202.5572.v1, 2012. This paper became Section 6 in [46]. With S. Basu, A. Gabrielov.
49. Triangulations of monotone families I: two-dimensional families, *Proc. London Math. Soc.*, **111**, 5, 2015, 1013–1051. With S. Basu, A. Gabrielov.
50. On topological lower bounds for algebraic computation trees, *Foundations of Computational Mathematics*, **17**, 1, 2017, 61–72.
With A. Gabrielov.
51. Topological lower bounds for arithmetic networks, *Computational Complexity*, **26**, 3, 2017, 687–715. With A. Gabrielov.
52. On irreducible components of real exponential hypersurfaces, *Arnold Mathematical Journal*, **3**, 3, 2017, 423–443. With C. Riener.
53. Upper bounds on Betti numbers of tropical prevarieties, *Arnold Mathematical Journal*, **4**, 1, 2018, 127–136. With D. Grigoriev.
54. Complexity of deciding whether a tropical linear prevariety is a tropical variety, *Appl. Algebra Engrg. Comm. Comput.*, **32**, 2, 2021, 157–174.
Extended abstract in: CASC 2018, Springer Lecture Notes in Computer Science, **11077**, 2018, 187–196. With D. Grigoriev.
2021 AAECC Best Paper Award.
55. Effective cylindrical cell decompositions for restricted sub-Pfaffian sets, *International Mathematics Research Notices*, 5, 2022, 3493–3510. With G. Binyamini.
56. Lecture notes on complexity of quantifier elimination over the reals, arXiv:2112.00456 [math.HO].
57. Partitioning theorems for sets of semi-Pfaffian sets, with applications, *Forum of Mathematics, Sigma*, 14:e5, 2026, 1–27. With M. Lotz and A. Natarajan.