

List of Publications*

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Journal Papers

1. O. V. Davydov, Asymptotic behavior of best approximations of individual functions of classes $W^r H_\omega$ in the metric L_p , *Dokl. Akad. Nauk SSSR* **306** (1989), 777–781 [in Russian]; English translation in *Soviet Mat. Dokl.* **39** (1989), 541–544.
2. O. V. Davydov, Asymptotic behavior of the best uniform approximations of individual functions by splines, *Ukrain. Mat. Zh.* **42** (1990), 59–64 [in Russian]; English translation in *Ukrainian Math. J.* **42** (1990), 50–54.
3. O. V. Davydov, Convergence of Lagrange interpolation processes in classes of differentiable functions, *Izv. Vyssh. Uchebn. Zaved. Mat.* (1990), no. 4, 74–77 [in Russian]; English translation in *Soviet Math. (Iz. VUZ)* **34** (1990), 89–92.
4. O. V. Davydov, Accuracy of the Jackson inequality for individual functions, *Ukrain. Mat. Zh.* **42** (1990), 1469–1475 [in Russian]; English translation in *Ukrainian Math. J.* **42** (1990), 1311–1316.
5. O. V. Davydov, On a problem of P. Butzer and W. Dickmeis, *Sem. Inst. Prikl. Mat. Dokl.* **5** (1990), no. 2, 47–50. [in Russian]
6. O. V. Davydov, Best uniform approximation of periodic functions by splines, *Izv. Vyssh. Uchebn. Zaved. Mat.* (1991), no. 5, 9–16 [in Russian]; English translation in *Soviet Math. (Iz. VUZ)* **35** (1991), 7–14.
7. O. V. Davydov, Approximation of functions of class $C(\varepsilon)$ by sequences of de la Vallée-Poussin sums, *Mat. Zametki* **49** (1991), 33–41 [in Russian]; English translation in *Math. Notes* **49** (1991), 577–583.
8. O. V. Davydov, Condensation of values of sequences of seminorms, *Ukrain. Mat. Zh.* **44** (1992), 467–474 [in Russian]; English translation in *Ukrainian Math. J.* **44** (1992), 409–416.
9. O. V. Davydov, Approximation of individual functions by rectangular Fourier sums, *Dokl. Akad. Nauk (Russia)* **327** (1992), 295–298 [in Russian]; English translation in *Russian Acad. Sci. Dokl. Math.* **46** (1993), 443–446.

*Preprint versions of the papers marked with an asterisk are available in PostScript format from the Web at <http://www.math.uni-giessen.de/oleg.davydov/>

10. O. V. Davydov, Some condensation theorems for semigroup operators, *Manuscripta Math.* **79** (1993), 435–446.
11. O. V. Davydov, Snake theorem for weak Descartes systems, *Ukrain. Mat. Zh.* **47** (1995), 315–321 [in Russian]; English translation in *Ukrainian Math. J.* **47** (1995), 369–375.
12. O. V. Davydov, A class of weak Chebyshev spaces and characterization of best approximations, *J. Approx. Theory* **81** (1995), 250–259.
13. O. V. Davydov, Note on the approximation of functions in Lipschitz spaces, *East J. Approx.* **1** (1995), 349–356.
14. O. V. Davydov, Sequences of rectangular Fourier sums of continuous functions with given majorants of mixed moduli of smoothness, *Mat. Sb.* **187** (1996), no. 7, 35–58 [in Russian]; English translation in *Russian Acad. Sci. Sb. Math.* **187** (1996), 981–1004.
15. (*) O. Davydov and A. Pinkus, Best approximation and cyclic variation diminishing kernels, *J. Approx. Theory* **89** (1997), 380–423.
16. (*) O. Davydov, On almost interpolation, *J. Approx. Theory* **91** (1997), 398–418.
17. O. Davydov, Appendix, in “Best approximation by periodic smooth functions”, by J. A. Oram, *J. Approx. Theory* **92** (1998), 159–166.
18. (*) O. Davydov, G. Nürnberger and F. Zeilfelder, Approximation order of bivariate spline interpolaton for arbitrary smoothness, *J. Comput. Appl. Math.* **90** (1998), 117–134.
19. (*) O. Davydov, M. Sommer and H. Strauss, On almost interpolation and locally linearly independent bases, *East J. Approx.* **5** (1999), 67–88.
20. (*) O. Davydov and M. Sommer, Interpolation by weak Chebyshev spaces, *J. Approx. Theory* **102** (2000), 243–262.
21. (*) O. Davydov, M. Sommer and H. Strauss, Interpolation by bivariate linear splines, *J. Comput. Appl. Math.* **119** (2000), 115–131.
22. (*) O. Davydov and G. Nürnberger, Interpolation by C^1 splines of degree $q \geq 4$ on triangulations, *J. Comput. Appl. Math.* **126** (2000), 159–183.
23. (*) O. Davydov and L. L. Schumaker, Locally linearly independent bases for bivariate polynomial spline spaces, *Advances in Comp. Math.* **13** (2000), 355–373.
24. (*) O. Davydov, G. Nürnberger and F. Zeilfelder, Bivariate spline interpolation with optimal approximation order, *Constr. Approx.* **17** (2001), 181–208.
25. (*) O. Davydov, Stable local bases for multivariate spline spaces, *J. Approx. Theory* **111** (2001), 267–297.
26. (*) M. D. Buhmann, O. Davydov and T. N. T. Goodman, Box spline prewavelets of small support, *J. Approx. Theory* **112** (2001), 16–27.

27. (*) O. Davydov and L. L. Schumaker, On stable local bases for bivariate polynomial spline spaces, *Constr. Approx.* **18** (2002), 87–116.
28. (*) O. Davydov and L. L. Schumaker, Stable approximation and interpolation with C^1 quartic bivariate splines, *SIAM J. Numer. Anal.* **39** (2002), 1732–1748.
29. O. Davydov, On local refinement of smooth finite elements and splines, *Mat. Model.* **14** (2002), no. 5, 109–116.
30. (*) M. D. Buhmann, O. Davydov and T. N. T. Goodman, Cubic spline prewavelets on the four-directional mesh, *Found. Comp. Math.* **3** (2003), 113–133.
31. (*) O. Davydov and P. Petrushev, Nonlinear approximation from differentiable piecewise polynomials, *SIAM J. Math. Anal.* **35** (2003), 708–758.
32. (*) O. Davydov and F. Zeilfelder, Scattered data fitting by direct extension of local polynomials to bivariate splines, *Advances in Comp. Math.* **21** (2004), 223–271.

Refereed Proceedings Papers

33. O. V. Davydov, Lagrange interpolation polynomial over equidistant nodes does not converge in measure to the function $|x|$ on $[-1, 1]$, in “Investigations in Current Problems in Summation and Approximation of Functions and their Applications,” (V. P. Motornyi, Ed.), pp. 22–25, Dnepropetrovsk. Gos. Univ., Dnepropetrovsk, 1986. [in Russian]
34. O. V. Davydov, Some conditions for the convergence of Lagrange interpolation processes in the classes A_R and C^∞ , in “Investigations in Current Problems in Summation and Approximation of Functions and their Applications,” (V. P. Motornyi, Ed.), pp. 16–23, Dnepropetrovsk. Gos. Univ., Dnepropetrovsk, 1987. [in Russian]
35. O. V. Davydov, Some estimates for approximation of functions by Hermitian splines, in “Investigations in Current Problems in Summation and Approximation of Functions and their Applications,” (V. P. Motornyi, Ed.), pp. 23–30, Dnepropetrovsk. Gos. Univ., Dnepropetrovsk, 1987. [in Russian]
36. O. V. Davydov, On the approximation of individual functions by Fourier sums and their means, in “Questions of Optimal Approximation of Functions and Summation of Series” (V. P. Motornyi, Ed.), pp. 20–23, Dnepropetrovsk. Gos. Univ., Dnepropetrovsk, 1988. [in Russian]
37. O. V. Davydov, Approximation of individual functions of the class H^α by piecewise linear functions with free knots, in “Theory of Approximation of Functions and Summation of Series” (V. P. Motornyi, Ed.), pp. 17–21, Dnepropetrovsk. Gos. Univ., Dnepropetrovsk, 1989. [in Russian]
38. O. V. Davydov, Notes on alternation theorems for periodic functions, in “Theory of Approximation of Functions and Summation of Series,” (V. P. Motornyi, Ed.), pp. 21–25, Dnepropetrovsk. Gos. Univ., Dnepropetrovsk, 1989. [in Russian]

39. O. V. Davydov, On the exact constant in an inequality of Jackson type for spline approximation, in "Problems in Analysis and Approximation," (N. P. Korneichuk, Ed.), pp. 38–51, Akad. Nauk Ukrain. SSR, Inst. Mat., Kiev, 1989. [in Russian]
40. O. V. Davydov, Condensation of values of seminorm sequences on the sets defined by means of majorants of the best approximations, in "Approximation of Functions by Polynomials and Splines and Summation of Series" (V. P. Motornyi, Ed.), pp. 18–24, Dnepropetrovsk. Gos. Univ., Dnepropetrovsk, 1990. [in Russian]
41. O. V. Davydov, Conditions for the uniqueness of the spline of best approximation and the best linear method for the class H^ω , in "Current Problems in Approximation Theory and Complex Analysis," (N. P. Korneichuk, Ed.), pp. 29–36, Akad. Nauk Ukrain. SSR, Inst. Mat., Kiev, 1990. [in Russian]
42. O. V. Davydov, Asymptotic behavior of approximations of individual functions and convergence of interpolation processes, in "Theory of Functions and Approximations: Proceedings of the 4th Saratov Winter Workshop (1988)," (A. A. Privalov, Ed.), vol. 2, pp. 79–81, Saratov Gos. Univ., Saratov, 1990. [in Russian]
43. O. V. Davydov, On the accuracy of inequalities of Jackson and Lebesgue type, in "Approximation of Functions and Summation of Series" (V. P. Motornyi, Ed.), pp. 19–28, Dnepropetrovsk. Gos. Univ., Dnepropetrovsk, 1991. [in Russian]
44. O. V. Davydov, Approximation of individual functions of class $C(\varepsilon)$, in "Proceedings of the All-Union Conference on the Theory of Approximation of Functions (Dnepropetrovsk, 1990)," (M. F. Timan, Ed.), pp. 39–40, Dnepropetrovsk. Gos. Agro. Univ., Dnepropetrovsk, 1991. [in Russian]
45. O. V. Davydov, V. A. Kofanov and S. A. Pichugov, On the residuality of sets of extremals for approximation of functional classes, in "Optimization of Methods of Approximation" (N. P. Korneichuk, Ed.), pp. 42–50, Akad. Nauk Ukrain. SSR, Inst. Mat., Kiev, 1992. [in Russian]
46. O. V. Davydov, Asymptotic behavior of the deviation of de la Vallée-Poussin sums for the classes of conjugate functions, in "Approximation of functions and summation of series" (V. P. Motornyi, Ed.), pp. 13–17, Dnepropetrovsk. Gos. Univ., Dnepropetrovsk, 1992. [in Russian]
47. O. V. Davydov, On the approximation of individual functions by some projectors, in "Proceedings of the 6th Saratov Winter Workshop (1992)," (A. A. Privalov, Ed.), 4 pages, Saratov Gos. Univ., Saratov, 1994. [in Russian]
48. (*) O. Davydov, Characterization of the best uniform approximation of periodic functions by convex classes defined by strictly CVD kernels, in "Approximation Theory VIII," (C. K. Chui and L. L. Schumaker, Eds.), Vol. 1: Approximation and Interpolation, pp. 177–184, World Scientific Publishing Co., 1995.
49. (*) O. Davydov, M. Sommer and H. Strauss, On almost interpolation by multivariate splines, in "Multivariate Approximation and Splines," (G. Nürnberger, J. W. Schmidt and G. Walz, Eds.), pp. 45–58, ISNM, Birkhäuser, 1997.

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51. (*) G. Nürnberger, O. Davydov, G. Walz and F. Zeilfelder, Interpolation by bivariate splines on crosscut partitions, in "Multivariate Approximation and Splines," (G. Nürnberger, J. W. Schmidt and G. Walz, Eds.), pp. 189–203, ISNM, Birkhäuser, 1997.
52. (*) O. Davydov, Locally linearly independent basis for C^1 bivariate splines of degree $q \geq 5$, in "Mathematical Methods for Curves and Surfaces II," (M. Dæhlen, T. Lyche, L. L. Schumaker, Eds.), pp. 71–78, Vanderbilt University Press, 1998.
53. (*) O. Davydov, G. Nürnberger and F. Zeilfelder, Interpolation by cubic splines on triangulations, in "Approximation Theory IX," (C. K. Chui and L. L. Schumaker, Eds.), Vol. 2: Computational Aspects, pp. 17–24, Vanderbilt University Press, 1998.
54. (*) O. Davydov and M. Sommer, Interpolation and almost interpolation by weak Chebyshev spaces, in "Approximation Theory IX," (C. K. Chui and L. L. Schumaker, Eds.), Vol. 2: Computational Aspects, pp. 25–32, Vanderbilt University Press, 1998.
55. (*) O. Davydov, G. Nürnberger and F. Zeilfelder, Interpolation by splines on triangulations, in "New Developments in Approximation Theory (IDoMAT 98)," (M. D. Buhmann, M. Felten, D. Mache and M. W. Müller, Eds.), pp. 49–70, ISNM 132, Birkhäuser, 1999.
56. (*) O. Davydov, G. Nürnberger and F. Zeilfelder, Cubic spline interpolation on nested polygon triangulations, in "Curve and Surface Fitting: Saint-Malo 1999," (A. Cohen, C. Rabut, and L. L. Schumaker, Eds.), pp. 161–170, Vanderbilt University Press, 2000.
57. (*) O. Davydov and L. L. Schumaker, Stable local nodal bases for C^1 bivariate polynomial splines, in "Curve and Surface Fitting: Saint-Malo 1999," (A. Cohen, C. Rabut, and L. L. Schumaker, Eds.), pp. 171–180, Vanderbilt University Press, 2000.
58. (*) O. Davydov, On the computation of stable local bases for bivariate polynomial splines, in "Trends in Approximation Theory," (K. Kopotun, T. Lyche, and M. Neamtu, Eds.), pp. 85–94, Vanderbilt University Press, 2001.
59. (*) J. Haber, F. Zeilfelder, O. Davydov and H.-P. Seidel, Smooth approximation and rendering of large scattered data sets, in "Proceedings of IEEE Visualization 2001," (Th. Ertl, K. Joy and A. Varshney, Eds.), pp. 341–347, 571, IEEE Computer Society, 2001.
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61. (*) O. Davydov, Locally stable spline bases on nested triangulations, in “Approximation Theory X: Wavelets, Splines, and Applications,” (C. K. Chui, L. L. Schumaker, and J. Stöckler, Eds.), pp. 231–240, Vanderbilt University Press, 2002.

Ph. D. Thesis

62. O. V. Davydov, On the asymptotic behavior of approximations of individual functions and functionals: Dissertation for the degree of Candidate of Physical and Mathematical Sciences, 75 pages, Dnepropetrovsk, 1987; *defended in* Inst. of Appl. Math. and Mech., Ukrainian Acad. Sci., Donetsk, 1988. [in Russian]
63. O. V. Davydov, On the asymptotic behavior of approximations of individual functions and functionals: Summary of the dissertation for the degree of Candidate of Physical and Mathematical Sciences, 13 pages, Inst. of Appl. Math. and Mech., Ukrainian Acad. of Sci., Donetsk, 1988. [in Russian]

Unpublished Technical Reports

64. O. V. Davydov, On the convergence of interpolation processes in the classes W^rH_ω , 15 pages, VINITI (Moscow), no. 4436–V87, Dnepropetrovsk, 1987. [in Russian]
65. O. V. Davydov, On the asymptotic behavior of the error of quadrature formulae for individual functions, 17 pages, VINITI (Moscow), no. 4437–V87, Dnepropetrovsk, 1987. [in Russian]
66. O. V. Davydov, Asymptotic behavior of approximations of individual functions by polynomials and splines, 26 pages, VINITI (Moscow), no. 406–V88, Dnepropetrovsk, 1988. [in Russian]
67. O. Davydov, A new version of quantitative resonance principle and applications: Summary, 24 pages, Dnepropetrovsk, 1994.

Submitted

68. (*) O. Davydov, R. Morandi and A. Sestini, Local hybrid approximation for scattered data fitting with bivariate splines, 21 pages.
69. (*) O. Davydov and R. Stevenson, Hierarchical Riesz bases for $H^s(\Omega)$, $1 < s < \frac{5}{2}$, 38 pages.
70. O. Davydov, A. Sestini and R. Morandi, Local RBF approximation for scattered data fitting with bivariate splines, 11 pages.

In Preparation

71. O. Davydov and F. Zeilfelder, Toolbox for two-stage scattered data fitting.