

# PUBLICATIONS\*

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## 1 Publications

### 1.1 Journal papers

1. On some step-size rules for Newton's method. *Operations Research* (1979) **7**, 111–115. (in Russian)
2. Some globally convergent modifications of Newton's method for solving systems of nonlinear equations. *Soviet Math. Dokl.* (1980) **22**, No. 2, pp. 376–378.
3. Interactive optimization software (DISO). *Transactions on Algorithms and Programs* (1981), No. 1/2, p. 20. (with E. N. Veselov *et al.*) (in Russian)
4. Conjugate direction methods for solving systems of equations and finding saddle points. Part 1. *Engineering Cybernetics* (1982) **20**, No. 3, pp. 13–19.
5. Conjugate direction methods for solving systems of equations and finding saddle points. Part 2. *Engineering Cybernetics* (1982) **20**, No. 4, pp. 23–31.
6. Stable versions of the secant method for solving systems of equations. *U.S.S.R. Comput. Maths and Math Phys.* (1983) **23**, No. 5, pp. 1–10.
7. Methods of the secant type for systems of equations with symmetric Jacobian matrix. *Numer. Funct. Analysis and Optimization* (1983) **6**, pp. 183–195.
8. Interactive software DISO: optimal control. *Transactions on Algorithms and Programs* (1985), No. 1, p. 53. (with Yu. G. Evtushenko *et al.*, in Russian)
9. On superlinear convergence of some stable variants of the secant method. *Z. angew. Math. und Mech.* (1986) **66**, No. 2, pp. 615–622.
10. Interactive software. *Transactions on Algorithms and Programs* (1986), No. 5, p. 20. (with S. B. Andreev *et al.*, in Russian)
11. Stable symmetric secant methods with restart. *Cybernetics and Systems Analysis* (1991) **27**, No. 3, pp. 390–396.
12. On using the minimum spanning tree algorithm for optimal secant approximation of derivatives. *Z. angew. Math. und Mech.* (1996) **76**, S3, pp. 389–390.

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13. A greedy algorithm for the optimal basis problem. *BIT Numerical Mathematics* (1997) **37** No. 3, pp. 591–599.
14. A limited-memory multipoint symmetric secant method for bound constrained optimization. *Annals of Operations Research*, (2002) **117**, pp. 51-70. (with J.M. Martínez and E.A. Pilotta)
15. Yury G. Evtushenko - A tribute. *Optim. Methods and Softw.*, (2005) **20**, pp. 1-7. (with A. Griewank and A. Lotov)
16. Monotonic regression for the detection of temporal trends in environmental quality data. *MATCH Commun. Math. Comput. Chem.* (2005) **54**, pp. 535-550. (with M. Hussian, A. Grimvall and O. Sysoev)
17. Data reordering in generalized PAV algorithm for monotonic regression. *Journal of Computational Mathematics* (2006) **24**, pp. 771-790. (with A. Grimvall and O. Sysoev)
18. Relay positioning for unmanned aerial vehicle surveillance. *International Journal of Robotics Research* (2010) **29**, pp. 1069-1087. (with P. Doherty, K. Holmberg, J. Kvarnström and P.-M. Olsson)
19. Optimal placement of UV-based communications relay nodes. *Journal of Global Optimization* (2010) **48**, pp. 511-531. (with P. Doherty, K. Holmberg and P.-M. Olsson)
20. A segmentation-based algorithm for large-scale partially ordered monotonic regression. *Computational Statistics and Data Analysis* (2011) **55**, pp. 2463-2476. (with A. Grimvall and O. Sysoev)
21. Monotonicity recovering optimization methods for postprocessing finite element solutions. *Journal of Computational Physics* (2012) **231**, pp. 3126-3142. (with Ivan Kapyrin and Yuri Vassilevski)
22. Global search strategies for solving multilinear least-squares problems. *Sultan Qaboos University Journal for Science* (2012) **17**, pp. 12-21. (with Mats Andersson, Hans Knutsson and Spartak Zikrin)
23. Bootstrap estimation of the variance of the error term in monotonic regression models. *Journal of Statistical Computation and Simulation* (2013), **83**, pp. 625-638. (with A. Grimvall and O. Sysoev)
24. Inverse Monte Carlo in a multilayered tissue model - merging diffuse reflectance spectroscopy and laser Doppler flowmetry. *Journal of Biomedical Optics* (2013), **18**, pp. 127004-1–127004-14. (with I. Fredriksson, M. Larsson and T. Strömberg)
25. Sparsity optimization in design of multidimensional filter networks. *Optimization and Engineering* (2015) **16**, pp. 259–277 (with Mats Andersson, Hans Knutsson and Spartak Zikrin)
26. Mathematical programs with cardinality constraints: Reformulation by complementarity-type conditions and a regularization method. *SIAM Journal on Optimization* (2016) **26**, pp. 397-425. (with Christian Kanzow and Alexandra Schwartz)
27. Bootstrap confidence intervals for large-scale multivariate monotonic regression problems. *Communications in Statistics – Simulation and Computation* (2016) **45**, pp. 1025–1040 (with A. Grimvall and O. Sysoev)

28. A statistical test of the equality of latent orders. *Journal of mathematical psychology* (2016) **70**, pp. 1-11. (with Michael L. Kalish, John C. Dunn and Oleg Sysoev)
29. Optimal scheduling for replacing perimeter guarding unmanned aerial vehicles. *Annals of Operations Research* (2017) **249**, pp. 163-174. DOI: 10.1007/s10479-016-2169-5 (with J. Kvarnström and P. Doherty)
30. A dual active-set algorithm for regularized monotonic regression. *Journal of Optimization Theory and Applications* (2017) **172**, pp. 929-949. DOI: 10.1007/s10957-017-1060-0 (with O. Sysoev)
31. A dual active-set algorithm for regularized slope-constrained monotonic regression. *Iranian Journal of Operations Research* (2017). **8**, No. 2, pp. 40-47. (with O. Sysoev)
32. On efficiently combining limited-memory and trust-region techniques. *Mathematical Programming Computation* (2017). **9**, pp. 101-134 (with Lujin Gong, Spartak Zikrin and Ya-xiang Yuan)
33. A smoothed monotonic regression via L2 regularization. Accepted for publication in: *Knowledge and Information Systems* (2018). DOI: 10.1007/s10115-018-1201-2 (with O. Sysoev)
34. Multipoint secant and interpolation methods with nonmonotone line search for solving systems of nonlinear equations. *Applied Mathematics and Computation* (2018). **338**, No. 1, pp. 421-431 (with Ahmad Kamandi)

## 1.2 Book Chapters, Conference Proceedings and Extended Abstracts

35. On general properties of a step-size rule for solving systems of nonlinear equations by Newton's method. In: *Transactions of MPhTI. Series "Aerophysics and Applied Mathematics"* (1978), MPhTI, Dolgoprudnyj, pp. 121-124. (in Russian)
36. On one principle of constructing quasi-Newton methods for solving systems of nonlinear equations. In: *Proc. of All-Union Seminar on Numerical Methods for Nonlinear Programming (Kharkov, 1979)* (1979), pp. 38-40. (in Russian)
37. Some methods of saddle-point search. In: *Proc. of All-Union Seminar on Numerical Methods for Nonlinear Programming (Kharkov, 1979)* (1979), pp. 45-47. (in Russian)
38. On the effect of computational accuracy on convergence of modified Newton's method in saddle-point search problems. In: *Transactions of MPhTI. Series "Aerophysics and Applied Mathematics"* (1979), MPhTI, Dolgoprudnyj, pp. 184-187. (in Russian)
39. On some numerical methods for saddle-point search. In: *Software Systems for Solving Optimal Planning Problems. The 6th All-Union Symposium (Pushino, 1980)* TsEMI AN SSSR, Moscow, pp. 40-41. (in Russian)
40. Convergence analysis of some saddle-point search methods. In: *Transactions of MPhTI. Series "Aerophysics and Applied Mathematics"* (1980), MPhTI, Dolgoprudnyj, pp. 96-98. (in Russian)
41. Secant methods for solving systems with symmetric Jacobian. In: *Mathematical Programming Methods and Software* (1981), Sverdlovsk, 25-26. (in Russian)

42. Stable secant methods. In: *Software Systems for Solving Optimal Planning Problems. The 7th All-Union Symposium, Narva* (1982) VINTI, Moscow, pp. 119–120. (in Russian)
43. On symmetric secant methods with restart. In: *Mathematical Programming Methods and Software* (1984), Sverdlovsk, 33–34. (in Russian)
44. Stabilization of the secant method via quasi-Newton approach. In: *System Modeling and Optimization, Lect. Notes in Control and Information Sciences* (1986) **84**, Springer-Verlag, Berlin, pp. 141–152.
45. Hybride Methoden der Optimierung für Parallelrechner. In: *19. Jahrestagung “Mathematische Optimierung”, April 1987, Sellin/Rügen* (1987) Humboldt-Universität zu Berlin, pp. 15–18. (with C. Richter)
46. Interactive optimization software DISO/SM. In: *Packages of Applied Programs. Software Development Environments* (1987) Nauka, Moscow, pp. 105–111. (with S. B. Andreev *et al.*, in Russian)
47. Parallel hybrid optimization methods. In: *Optimization, Parallel Processing and Applications, Lect. Notes in Economics and Math. Systems* (1988) **304**, Springer-Verlag, Berlin, pp. 16–23 (with C. Richter).
48. A new vector norm for nonlinear curve fitting and some other optimization problems. In: *33. Int. Wiss. Kolloq. Fortzugsreihe “Mathematische Optimierung — Theorie und Anwendungen”*, TH Ilmenau, (1988), pp. 15–17.
49. On a norm for the parameter identification problem. In: *Software Systems for Solving Optimal Planning Problems. The 10th All-Union Symposium, Narva* (1988) TsEMI, Moscow, pp. 17–18. (In Russian)
50. Quasi-Newton variants of Brent’s method. In: *Int. Seminar on Optimization Methods and Their Applications. Baikal, USSR* (1989) pp. 23–24.
51. Globally convergent quasi-Newton-type methods. In: *Mathematical Programming Methods and Software* (1989), UrO AN SSSR, Sverdlovsk, 29–30. (in Russian)
52. Component-wise quasi-Newton methods. In: *Numerical Methods of Nonlinear Programming and their Implementations*, Akademie-Verlag, Berlin (1991), pp. 17–27.
53. A curvilinear search for globalization of quasi-Newton methods. In: *Conference on Optimization and Software OPTI-SOFT’91, Quedlinburg* (1991), pp. 4–6.
54. Stable multi-point secant methods with released requirements to point’s position. In: J. Henry *et al.* (Eds), *System Modelling and Optimization. Lect Notes Control Inf. Sci.* (1994) **197**, Springer-Verlag, London, pp. 225–236. (with U. Felgenhauer)
55. On properties of Newton’s method for smooth and nonsmooth equations. In: R.P. Agarwal (Ed.) *Recent Trends in Optimization Theory and Applications* (1995), World Scientific, pp.17–24.
56. An algorithm for isotonic regression problems. In: P. Neittaanmäki *et al.* (Eds.) *The Proceedings of the 4th European Congress of Computational Methods in Applied Science and Engineering ‘ECCOMAS 2004’*. (with O. Sysoev, A. Grimvall and M. Hussian)

57. A generalised PAV algorithm for monotonic regression in several variables. In: J. Antoch (Ed.), COMPSTAT, *Proceedings in Computational Statistics, 16th Symposium Held in Prague, Czech Republic* (2004). Physica-Verlag, A Springer Company, Heidelberg, NY, pp. 761-767. (with A. Grimvall and M. Hussian)
58. Monotonic regression for trend assessment of environmental quality data. In: P. Neittaanmäki et al. (Eds.) *The Proceedings of the 4th European Congress of Computational Methods in Applied Science and Engineering 'ECCOMAS 2004'*. (with M. Hussian, A. Grimvall and O. Sysoev)
59. An  $O(n^2)$  algorithm for isotonic regression problems. In: G. Di Pillo and M. Roma (Eds) *Large Scale Nonlinear Optimization*, Series: Nonconvex Optimization and Its Applications (2006), **83**, Springer-Verlag, pp. 25-33. (with O. Sysoev, A. Grimvall and M. Hussian)
60. A new approach for treating multiple extremal points in multi-linear least squares filter design. In: *Proceedings of the SSBA Symposium on Image Analysis* (2007), Linköping, Sweden, pp. 61-64. (with B. Svensson, M. Andersson and H. Knutsson)
61. Positioning unmanned aerial vehicles as communication relays for surveillance tasks. In: *Proceedings of Robotics: Science and Systems* (2009), Seattle, USA.  
<http://www.roboticsproceedings.org/rss05/p33.html>  
(with P. Doherty, K. Holmberg, J. Kvarnström and P.-M. Olsson)
62. Generalized PAV algorithm with block refinement for partially ordered monotonic regression. In: A. Feelders and R. Pottharst (Eds.) *Proceedings of the Workshop on Learning Monotone Models from Data at the European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases* (2009), pp. 23-37. (with A. Grimvall and O. Sysoev)
63. Positioning unmanned aerial vehicles as communication relays for surveillance tasks. In: J. Trinkle, Y. Matsuoka and J.A. Castellanos (Eds.) *Robotics, Science and Systems V*. MIT Press, 2010, pp. 257-264. (with P. Doherty, K. Holmberg, J. Kvarnström and P.-M. Olsson)
64. Generating UAV communication networks for monitoring and surveillance. In: *Proc. of the 11th International Conference on Control, Automation, Robotics and Vision (ICARCV 2010)*, pp. 1070-1077. (with P. Doherty, K. Holmberg, J. Kvarnström and P.-M. Olsson)
65. Local search for hop-constrained directed Steiner tree problem with application to UAV-based multi-target surveillance. In: S. Butenko, E.L. Pasiliao and V. Shylo (Eds), *Examining Robustness and Vulnerability of Networked Systems*. IOS Press, 2014, pp.26-50. (with P. Doherty and J. Kvarnström)
66. On a reformulation of mathematical programs with cardinality constraints. In: David Gao, Ning Ruan and Wenxun Xing (Eds), *Advances in Global Optimization*, Springer, 2015, pp. 3-14. (with C. Kanzow and A. Schwartz)

### 1.3 Preprints

67. Interactive software DISO: The formulation of problems and their programming interface. VINTI (1982) No. 2715-82 Dep, Moscow. (with E. N. Veselov *et al.*, in Russian)

68. Interactive software DISO: Nonlinear programming. VINTI (1982) No. 2716–82 Dep, Moscow. (with Yu. G. Evtushenko *et al.*, in Russian)
69. Interactive software DISO: Unconstrained minimization. VINTI (1982) No. 2717–82 Dep, Moscow. (with Yu. G. Evtushenko *et al.*, in Russian)
70. Component–wise quasi–Newton methods. Report DMSIA 1990/6, University of Bergamo.
71. A curvilinear search for globalization of quasi-Newton methods. Preprint No. 5/91, Techn. Hochschule Köthen, Inst. für Math., Köthen, 1991.
72. On some properties of Newton’s method for solving smooth and nonsmooth equations. Preprint N 07–13–91 (1991), Inst. für Numerische Mathematik, Technische Universität Dresden.
73. Stable multipoint secant methods with relaxed requirements to point’s position. Preprint MATH–NM 09–93 (1993), Inst. für Numerische Mathematik, Technische Universität Dresden. (with U. Felgenhauer)
74. On properties of Newton’s method for smooth and nonsmooth equations. Technical report TR/PA/95/14 (1995), CERFACS.
75. An MST–type algorithm for the optimal basis problem. Technical report TR/PA/95/22 (1995), CERFACS.
76. A limited-memory multipoint symmetric secant method for bound constrained optimization. Technical Report LiTH-MAT-R-2000-26 (2000), Department of Mathematics, Linköping University. (with J.M. Martínez and E.A. Pilotta)
77. On a new norm for data fitting and optimization problems. Technical Report LiTH-MAT-R-2001-29 (2001), Department of Mathematics, Linköping University. (with B. Merkulov)
78. Monotonic regression for assessment of trends in environmental quality data. Technical Report LiTH-MAT-R-2004-01 (2004), Department of Mathematics, Linköping University. (with M. Hussian, A. Grimvall and O. Sysoev)
79. Data reordering in generalized PAV algorithm for monotonic regression. Accepted for publication. Technical Report LiTH-MAT-R-2006-06 (2006), Department of Mathematics, Linköping University. (with A. Grimvall and O. Sysoev)
80. A dual ascent method for the hop-constrained shortest path problem with application to positioning of unmanned aerial vehicles. Technical Report LiTH-MAT-R-2008-07 (2008), Department of Mathematics, Linköping University. (with K. Holmberg and P.-M. Olsson)
81. Optimal placement of communications relay nodes. Technical Report LiTH-MAT-R-2009-03 (2009), Department of Mathematics, Linköping University. (with P. Doherty, K. Holmberg and P.-M. Olsson)
82. Approximate spectral factorization for design of efficient sub-filter sequences, Technical Report LiTH-MAT-R-2011/14-SE (2011), Department of Mathematics, Linköping University. (with Björn Norell, Mats Andersson and Hans Knutsson)
83. Monotonicity recovering optimization methods for postprocessing finite element solutions. Technical Report LiTH-MAT-R-2011/08–SE (2011), Department of Mathematics, Linköping University. (with Ivan Kapyrin and Yuri Vassilevski)

84. Global search strategies for solving multilinear least-squares problems. Technical Report LiTH-MAT-R-2011/17-SE (2011), Department of Mathematics, Linköping University. (with Mats Andersson, Hans Knutsson and Spartak Zikrin)
85. On efficiently combining limited memory and trust-region techniques. Technical Report LiTH-MAT-R-2013/13-SE (2013), Department of Mathematics, Linköping University. (with Lujin Gong, Ya-xiang Yuan and Spartak Zikrin)
86. Sparsity optimization in design of multidimensional filter networks. Technical Report LiTH-MAT-R-2013/16-SE (2013), Department of Mathematics, Linköping University. (with Mats Andersson, Hans Knutsson and Spartak Zikrin)
87. Optimal scheduling for replacing perimeter guarding unmanned aerial vehicles. Technical Report LiTH-MAT-R-2014/9-SE (2014), Department of Mathematics, Linköping University. (with P. Doherty and J. Kvarnström)
88. Local search for hop-constrained directed Steiner tree problem with application to UAV-based multi-target surveillance. Technical Report LiTH-MAT-R-2014/10-SE (2014), Department of Mathematics, Linköping University. (with P. Doherty and J. Kvarnström)
89. Mathematical programs with cardinality constraints: Reformulation by complementarity-type constraints and a regularization method. Preprint 324, Institute of Mathematics, University of Würzburg, Würzburg, July 2014. (with C. Kanzow and A. Schwartz)
90. Regularized monotonic regression. Technical Report LiTH-MAT-R-2016/02-SE (2016), Department of Mathematics, Linköping University. (with Oleg Sysoev)
91. A smoothed monotonic regression via  $L_2$  regularization. Technical Report LiTH-MAT-R-2016/01-SE (2016), Department of Mathematics, Linköping University. (with Oleg Sysoev)
92. Shape-changing L-SR1 trust-region methods. (2016) arXiv:1607.03533 [math.OC] (with Johannes Brust, Jennifer B. Erway, Roummel F. Marcia, Ya-xiang Yuan)
93. Multipoint secant and interpolation methods with nonmonotone line search for solving systems of nonlinear equations. (2017) arXiv: 1712.01142 (with Ahmad Kamandi)

#### 1.4 Manuscripts Unpublished and under Preparation

93. Numerical methods for saddle-point search. PhD Thesis (1980). MPhTI, Moscow. (in Russian)
94. Convergence analysis of one iterative linear programming algorithm (1992) (with C. G. Broyden)
95. A globally convergent quasi-Newton algorithm for nonlinear equations (with F. Bonnans)
96. Monotonicity-preserving interpolation of scattered multivariate data (with Alexander Danilov and Yuri Vassilevski)