1 Publications

1.1 Journal papers


10. Interactive software. *Transactions on Algorithms and Programs* (1986), No. 5, p. 20. (with S. B. Andreeev et al., in Russian)


33. A smoothed monotonic regression via L2 regularization. Accepted for publication in: *Knowledge and Information Systems* (2018). (with O. Sysoev)


### 1.2 Book Chapters, Conference Proceedings and Extended Abstracts


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)


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)


1.4 Manuscripts Unpublished and under Preparation


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)
2 Presentations

1984

• International Institute for Applied System Analysis (Laxenburg, Austria) “The use of flow model analysis (FMA) in the case of incomplete mathematical models” (co-authors: A. Golovin, K. Kim, I. Shompolov, A. Umnov)

1985

• 12th IFIP Conference on System Modeling and Optimization (Budapest, Hungary) “Stabilization of the secant method via quasi–Newton approach”

1986

• Technical University of Dresden (Germany) “Newton–type methods for solving systems of nonlinear equations and saddle–point search problems”
• International Conference on Mathematical Optimization — Theory and Applications (Eisenach, Germany) “Stable secant methods based on a quasi-Newton approach”
• Martin–Luther University of Halle (Germany) “Stabilization of the secant method”
• Technical University of Köthen (Germany) “Parallel secant type algorithms”
• Institute of Mathematics of the GDR Academy of Sciences (Berlin, Germany) “Symmetric secant type methods”

1987

• Systems Research Institute of the Polish Academy of Sciences (Warsaw, Poland) “Stable multi–point symmetric secant methods”
• 19th Conference on Mathematical Optimization (Selling, Rugen, Germany) “Hybrid methods for parallel optimization” (co–author: C. Richter)
• Workshop on Advanced Computation Techniques, Parallel Processing and Optimization (Karlsruhe, Germany) “Parallel hybrid optimization methods” (co–author: C. Richter)

1988

• 33rd International Colloquium on Mathematical Optimization — Theory and Applications (Ilmenau, Germany) “A new vector norm for nonlinear curve fitting and some other optimization problems”

1989

• 14th IFIP Conference on System Modeling and Optimization (Leipzig, Germany) “Quasi-Newton variants of Brent’s method”
• 1st International Conference on Optimization Methods and Software OPTI-SOFT’89 (Quedlinburg, Germany) “Component–wise quasi–Newton methods”
1990

- **NATO Advanced Study Institute on Computer Algorithms for Solving Linear Algebraic Systems: The State of the Art** (Il Ciocco, Italy) “Numerical methods for solving systems of simultaneous nonlinear equations (a review)”
- **Institute of Systems Research and Informatics IASI** (Rome, Italy) “Stable secant methods”
- **Institute of Applied Mathematics and Informatics** (Milan, Italy) “Conjugate directions type methods for solving systems of nonlinear equations and for saddle–point search”
- **Research Center on Automatics** (Milan, Italy) “A new vector norm for nonlinear curve fitting and some other optimization problems”
- **University of Bergamo** (Italy) “Quasi–Newton variants of ABS methods”
- **Cornell University** (Ithaca, USA) “Component–wise quasi–Newton methods”
- **Argonne National Laboratory** (USA) “Conjugate direction methods for saddle–point search and solving systems of monotone nonlinear equations”
- **Northwestern University** (USA) “Secant methods for solving systems of nonlinear equations with symmetric Jacobian matrix”
- **University of Colorado at Boulder** (USA) “Globalization of quasi–Newton methods for solving nonlinear equations”
- **Rice University** (Houston, USA) “Quasi–Newton variants of Brent’s method”

1991

- **14th International Symposium on Mathematical Programming** (Amsterdam, The Netherlands) “Globalization of quasi–Newton methods”
- **2nd International Conference on Optimization Methods and Software OPTI–SOFT’91** (Quedlinburg, Germany) “A curvilinear search for globalization of quasi–Newton methods”
- **University of Bayreuth** (Germany) “Newton’s method for solving smooth and nonsmooth equations”
- **Martin–Luther University** (Halle, Germany) “Globally convergent modifications of Newton and quasi–Newton methods”
- **Technical University of Köthen** (Germany) “Numerical methods for solving systems of nonlinear equations (a review)”
- **Technical University of Dresden** (Germany) “Globalization of Newton and quasi–Newton methods”
- **Humboldt University** (Berlin, Germany) “On some properties of Newton’s method for solving smooth and nonsmooth equations”

1992
• INRIA (Rocquencourt, France) “Numerical methods for solving systems of nonlinear equations (a review)”

• University of Paris IV (France) “Newton type methods for solving smooth and nonsmooth equations”

• 1st Biennial Italian–Soviet Conference on Methods and Applications of Mathematical Programming (Cetraro, Italy) “Stable multipoint secant methods with released requirements to points position” (co–author: U. Felgenhauer)

• Institute of Systems Research and Informatics IASI (Rome, Italy) ”Globalization of quasi–Newton methods by curvilinear search”

• University of Bologna (Italy) “Numerical methods for solving systems of nonlinear equations (a review)”

• University of Calabria (Italy) “Globalization strategies for Newton and quasi–Newton methods”

• University of Bari (Italy) “Numerical methods for solving systems of nonlinear equations (a review)”

• Workshop on ABS Methods (Bergamo, Italy) “On globalization of ABS methods”

• Institute of Information Theory and Automation of the Czechoslovak Academy of Sciences (Prague, Czechoslovakia) “Numerical methods for solving systems of nonlinear equations (a review)”

1993

• Bologna University (Italy) “Conjugate directions type methods for saddle–point search and solving systems of nonlinear equations”

• 16th IFIP Conference on System Modeling and Optimization (Compiegne, France) “Stable multi–point secant methods with released requirements to point’s position” (co–author: U. Felgenhauer)

1995

• 1st INFORM International Conference (Singapore) “Multipoint secant approximation for nonlinear optimization” (invited speaker at a cluster session)

• 3rd International Congress on Industrial and Applied Mathematics ICIAM 95 (Hamburg, Germany) “On using of minimum spanning tree algorithm for optimal secant approximation of derivatives”

• University of Paul Sabatier (Toulouse, France) “A generalization of minimum spanning tree problem and its application to optimal secant approximation of derivatives”

1996

• Workshop on Linear Algebra in Optimization (Albi, France) “An MST–type algorithm for the optimal basis problem”

• 5th SIAM Conference on Optimization (Victoria, Canada) “Interpolation methods for optimization and nonlinear equations”

• ICASE, NASA (Langley, USA) “Interpolation methods for optimization and nonlinear equations”

• Utah State University (Logan, USA) “Interpolation methods for optimization and nonlinear equations”

• Georgia Institute of Technology (Atlanta, USA) “TV–norms and their applications” (co-author: B. Merkulov)

• NATO Advanced Research Workshop on High Performance Computing (Cetraro, Italy) “Parallelization of interpolation methods for optimization and nonlinear equations” (invited speaker)

• Conference on Numerical Mathematics (University of Cambridge, England) “TV norms and their applications” (co-author: B. Merkulov)

• 2nd World Congress of Nonlinear Analysts (Athens, Greece) “Interpolation methods for optimization and nonlinear equations” (invited speaker)

• 2nd ECCOMAS Conference on Numerical Methods in Engineering (Paris, France) “TV norms and their applications” (co-author: B. Merkulov)

1997

• IV International Conference on Approximation and Optimization (Caracas, Venezuela) “Interpolation methods for optimization and nonlinear equations”

• The International Symposium on Mathematical Programming (Lausanne, Switzerland) “A greedy algorithm for the optimal basis problem”, “On a new vector norm for optimization problems” (co-author: B. Merkulov)

• University of Paul Sabatier (Toulouse, France) “A new vector norm for data fitting and other optimization problems” (co-author: B. Merkulov)

1998

• University of Campinas (Campinas, Brazil) “A greedy algorithm for the optimal basis problem and its application to interpolation methods”, “Symmetric secant- and interpolation-type methods”, “A new vector norm for optimization problems” (co-author: B. Merkulov) “Symmetric multipoint secant approximations in limited memory methods”

• Federal University of Rio de Janeiro (Rio de Janeiro, Brazil) “A greedy algorithm for the optimal basis problem and its application to interpolation methods”, “A new vector norm for data fitting and optimization problems” (co-author: B. Merkulov)
• **Linköping University (Linköping, Sweden)**
  “A greedy algorithm for the optimal basis problem and its application to interpolation methods”

• **International Conference on Nonlinear Programming And Variational Inequalities (Hong Kong)** “A new vector norm for data fitting and optimization problems” (**invited speaker**) (co–author: B. Merkulov)

1999

• **Royal Institute of Technology (KTH), Stockholm, Sweden**
  “A greedy algorithm for the optimal basis problem and its application to interpolation methods”

• **University of Rome “La Sapienza”, Italy**
  “A greedy algorithm for the optimal basis problem and its application to interpolation methods”

• **University of Ferrara, Italy**
  “A new vector norm for nonlinear data fitting and optimization problems”

• **University of Bergamo, Italy**
  “Symmetric multipoint secant approximations in limited memory methods”

• **University of Calabria, Italy**
  “A new vector norm for nonlinear data fitting and optimization problems”,
  “A greedy algorithm for the optimal basis problem and its application to interpolation methods”,
  “Symmetric multipoint secant approximations in limited memory methods”

2000

• **The 9th Stockholm Optimization Days, Stockholm, Sweden**
  “A new vector norm for nonlinear data fitting and optimization problems”

• **The Third World Congress of Nonlinear Analysts, Catania, Italy**
  “A new vector norm for data fitting and optimization problems” (**invited speaker**) (co–author: B. Merkulov)

• **The 17th International Symposium on Mathematical Programming, Atlanta, U.S.A.**
  “Limited memory multipoint symmetric secant approximation of derivatives” (co–authors: J.M. Martinez and E. Pilotta)

2001

• **An International Conference on Numerical Optimization and Numerical Linear Algebra, Dunhuang, China**
  “Optimal basis algorithm and its application to matrix scaling” (**invited plenary speaker**) 

• **Institute of Computational Mathematics, Chinese Academy of Sciences, China**
  “A new vector norm for nonlinear data fitting and optimization problems”,
  “Interpolation methods for optimization and nonlinear equations”,
  “Symmetric multipoint secant approximations in limited memory methods”
2002

- An International Conference on Optimization Methods and Software (2002, Hangzhou, China)
  “Limited Memory Methods with Shape Changing Trust Region” (co-author: Ya-xiang Yuan)

2003

- The University of Essex, United Kingdom
  “Optimal basis algorithm and its application to matrix scaling”

- The 18th International Symposium on Mathematical Programming (Copenhagen, Denmark August 18-22, 2003)
  “On Limited Memory Methods with Shape Changing Trust Region” (co-author: Ya-xiang Yuan)

2004

- Workshop on Large Scale Nonlinear Optimization (June 22 - July 1, 2004, Erice, Italy)
  “An $O(n^2)$ algorithm for isotonic regression problems” invited plenary speaker (co-authors: O. Sysoev, A. Grimvall and M. Hussian)

- the 4th European Congress of Computational Methods in Applied Science and Engineering ‘ECCOMAS 2004’ (Jyvaskyla, Finland)
  “An algorithm for isotonic regression problems” (co-authors: O. Sysoev, A. Grimvall and M. Hussian)

- 35th Annual Conference of the Italian Operations Research Society (Lecce, Italy)
  “Isotonic regression: Algorithms and applications” invited plenary speaker (co-authors: O. Sysoev, A. Grimvall and M. Hussian)

2005

- 8th SIAM Conference on Optimization (Stockholm, Sweden)
  “A fast algorithm for solving isotonic regression problem” (co-authors: O. Sysoev, A. Grimvall and M. Hussian)

- International Workshop on Optimization (Shanghai, China)
  “Optimization algorithms for solving isotonic regression problem” invited plenary speaker (co-authors: O. Sysoev, A. Grimvall and M. Hussian)

- International Conference on Scientific Computing (Nanjing, China)
  “Fast optimization algorithms for problems with monotonicity constraints” invited plenary speaker (co-authors: O. Sysoev, A. Grimvall and M. Hussian)

- Fudan University (Shanghai, China)
  “Isotonic regression: Algorithms and applications in management science” (co-authors: O. Sysoev, A. Grimvall and M. Hussian)

- Conference on Least Squares and Optimization (Umea, Sweden)
  “New algorithms for monotonic data fitting and interpolation” invited plenary speaker (co-authors: O. Sysoev and A. Grimvall)
2006

- *Int. Conference on Numerical Geometry, Grid Generation and Scientific Computing (Moscow, Russia)*
  “Monotonic data fitting and interpolation” **invited speaker** (co–authors: A. Grimvall and O. Sysoev)

- *Workshop on Applied Mathematics (Linköping, Sweden)* “A novel approach in multilinear least-squares with application to optimal design of filter networks” (co–authors: H. Knutsson and B. Svensson)

2007

- *the Swedish Symp. on Image Analysis (Linköping, Sweden)*
  “A new approach for treating multiple extremal points in multi-linear least squares filter design” (co–authors: M. Andersson, H. Knutsson and B. Svensson)

- *EUROPT-OMS Conf. on Optimization (Prague, Czech Republic)*
  “New optimization algorithms for large-scale isotonic regression in L2-norm” (co–authors: A. Grimvall and O. Sysoev)

- *the 6th International Conf. on Numerical Linear Algebra and Optimization (Urumqi, China)*
  “Optimization methods for postprocessing finite element solutions” **invited plenary speaker** (co–authors: Ivan Kapyrin and Yuri Vassilevski)

- *Conf. on High-Performance Computing (Toulouse, France)*
  “Monotonic data fitting and interpolation with application to postprocessing of FE solutions” **invited speaker** (co–authors: A. Grimvall, O. Sysoev, Ivan Kapyrin and Yuri Vassilevski)

2008

- *Conf. on Numerical Analysis and Optimization (Muscat, Oman)*
  “Optimal allocation of communications relay nodes” **invited plenary speaker** (co–authors: P. Doherty, K. Holmberg and P.-M. Olsson)

- *Int. Conf. on Numerical Geometry, Grid Generation and Scientific Computing (Moscow, Russia)*
  “Monotonicity recovering postprocessing of FE solutions” **invited speaker** (co–authors: Ivan Kapyrin and Yuri Vassilevski)

- *Workshop on Inverse Problems and Applications (Norrköping, Sweden)*
  “A novel approach in multilinear least-squares with application to design of filter networks” (co–authors: M. Andersson, H. Knutsson and B. Svensson)

2009

- *3rd Nordic Optimization Symposium (Stockholm, Sweden)*
  “A novel approach in multilinear least-squares with application to design of filter networks” (co–authors: M. Andersson, H. Knutsson and B. Svensson)
• The International Conference on Engineering and Computational Mathematics (Hong Kong)
  “A novel approach in multilinear least-squares with application to design of filter networks”
  invited speaker (co–authors: M. Andersson, H. Knutsson and B. Svensson)

• 23rd European Conference on Operational Research (Bonn, Germany)
  “Optimal placement of communications relay nodes” (co–authors: P. Doherty, K. Holmberg
  and P.-M. Olsson)

• The European Conference on Machine Learning and Principles and Practice of Knowledge
  Discovery in Databases (Blend, Slovenia)
  “Generalized PAV algorithm with block refinement for partially ordered monotonic regression”
  (co-authors: A. Grimvall and O. Sysoev)

2010

• The 2nd International Conference on the Dynamics of Information Systems (Florida, USA)
  “Optimal positioning of unmanned aerial vehicles for surveillance” keynote speaker
  (co-authors: P. Doherty, K. Holmberg, J. Kvarnström and P.-M. Olsson)

• The 3rd Yalta Optimization Conference (Yalta, Ukraine)
  “Local search for hop-constrained directed Steiner tree problem with application to UAV-
  based multi-target surveillance” keynote speaker (co-authors: P. Doherty, K. Holmberg, J.
  Kvarnström and P.-M. Olsson)

• Center for Applied Optimization, University of Florida, Gainesville, USA “A novel approach
  in multilinear least-squares with application to design of filter networks” (co–authors: M.
  Andersson, H. Knutsson and B. Svensson)

• Texas A&M University, College Station, USA; Rice University, Houston, USA; Prairie View
  A&M University, TX, USA
  “Optimal positioning of unmanned aerial vehicles for surveillance” (co-authors: P. Doherty,
  K. Holmberg, J. Kvarnström and P.-M. Olsson)

• ExxonMobil Upstream Research Company, Houston, USA
  “Monotonicity recovering optimization methods for postprocessing finite element solutions”
  (co-authors: Ivan Kapyrin and Yuri Vassilevski)

• Conference on Algorithmic Differentiation, Optimization, and Beyond (Nice, France)
  “Monotonicity recovering optimization methods for postprocessing finite element solutions”
  (co–authors: Ivan Kapyrin and Yuri Vassilevski)

• Workshop on Large Scale Convex Quadratic Programming (Leuven, Belgium)
  “Monotonicity recovering QP-based methods for postprocessing finite element solutions” (co–
  authors: Ivan Kapyrin and Yuri Vassilevski)

• Ghent University, Belgium “Methods for solving large-scale monotonic regression problems”

• Center for Operations Research and Econometrics, UCL (Louvain-la-Neuve, Belgium)
  “Optimal basis algorithm and its application to matrix scaling”

2011
• **The 2nd International Conf. on Optimization and Numerical Analysis** (Muscat, Oman)  
“A novel approach in multilinear least-squares with application to design of filter networks”  
**invited plenary speaker** (co-authors: M. Andersson, H. Knutsson, B. Svensson and S. Zikrin)

• **SIAM Conference on Optimization** (Darmstadt, Germany) “Local search for hop-constrained directed Steiner tree problem with application to UAV-based multi-target surveillance” (co-authors: P. Doherty, K. Holmberg, J. Kvarnström and P.-M. Olsson)

• **2nd World Congress on Global Optimization** (Crete, Greece) “Global search strategies for solving multilinear least-squares problems” (co-author: Spartak Zikrin)

• **8th Int. Conf. on Numerical Optimization and Numerical Linear Algebra** (Xiamen, China) “Local search for hop-constrained directed Steiner tree problem with application to UAV-based multi-target surveillance” **invited plenary speaker** (co-authors: P. Doherty, K. Holmberg, J. Kvarnström and P.-M. Olsson)

2012

• **3rd International Conference on Optimization Methods and Software** (Chania, Greece)  
“Monotonicity recovering optimization methods for postprocessing finite element solutions” (co-authors: Ivan Kapyrin and Yuri Vassilevski)

• **21st International Symposium on Mathematical Programming** (Berlin, Germany)  
“An approach to solving decomposable optimization problems with coupling constraints” (co-authors: John C. Dunn and Mike Kalish)

2013

• **NATO Advanced Research Workshop: Examining Robustness and Vulnerability of Critical Infrastructure Networks** (Kiev, Ukraine)  
“Local search for hop-constrained directed Steiner tree problem with application to UAV-based multi-target surveillance” **invited speaker** (Co-authors: P. Doherty, K. Holmberg, J. Kvarnström and P.-M. Olsson)

• **Conf. on Numerical Computations: Theory and Algorithms** (Falerna, Italy)  
“Limited-memory Methods with Shape Changing Trust Region” (Co-authors: Lujin Gong, Ya-xiang Yuan, Spartak Zikrin)

• **The 3rd World Congress on Global Optimization** (Huangshan, China)  
“On a reduction of cardinality to complementarity in sparse optimization” **keynote speaker** (Co-authors: Christian Kanzow and Alexandra Schwartz)

• **The 7th Moscow Conference on Operations Research** (Moscow, Russia)  
“On combining limited-memory and trust-region approaches in large-scale optimization” (Co-authors: Lujin Gong, Ya-xiang Yuan, Spartak Zikrin)

• **Seminar on Optimization broadcasted via SigmaOpt access grid to universities in Australia**  
“An approach to solving decomposable optimization problems with coupling constraints” (co-authors: John C. Dunn and Mike Kalish)
• Curtin University (Perth, Australia)
  “An approach to solving decomposable optimization problems with coupling constraints”
  (co–authors: John C. Dunn and Mike Kalish)

2014-2016
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