Jacek Gondzio

Professor of Optimization

School of Mathematics
University of Edinburgh, Scotland, UK

[Publications (1990-present)]
[Recent Reports (2013-present)]

Curriculum Vitae (UPDATED *November 2022*)

Employment

I hold a Master of Engineering degree in Electronics (1983) and a PhD in Automatic Control and Robotics (1989), both from the Department of Electronics, Warsaw University of Technology.

From 1989 till September 1993 I was an Assistant Professor at the Systems Research Institute of the Polish Academy of Sciences, Warsaw, Poland.

From October 1993 till September 1998 I was a Research Fellow in LogiLab at the Department of Management Studies of the University of Geneva, Switzerland.

I have been in Edinburgh since October 1st, 1998: Lecturer (1998-2000), Reader (2000-2005), Professor (2005-present).

Research Interests

My research interests include the theory and implementation of large scale optmization methods. I have been involved in the development of the simplex, simplex-type and interior point methods for linear, quadratic, nonlinear and semidefinite programming, cutting plane methods for convex nondifferentiable optimization and column generation approaches for combinatorial optimization.

Ongoing Research Projects

- Computational design optimization of large-scale building structures: methods, benchmarking and applications
  (2016-2019) EP/N019652/1 (EPSRC grant).
- IP-MATCH: Integer programming for large and complex matching problems
  (2017-2020) EP/P029825/1 (EPSRC grant)
  (with Sergio Garcia Quiles and Joerg Kalcsics).
- Fast interior point method for linear programming problems
  (2017-2018) Google Research Award, Google, Paris, France.
- Risk concentration measurement
  (2016-2020) (EPSRC Impact Acceleration Account and Standard Life Investments)
  (with Sergio Garcia Quiles, Joerg Kalcsics and Sotirios Sabanis).
- Randomly sampled cyclic alternating direction method of multipliers
  (2018-2021) Oracle Labs Research Award, Oracle Labs, Redwood Shores, CA 94065, USA.
- Matrix-free preconditioners for large-scale convex constrained optimization problems
  (2019-2020) University of Padova, Italy

(with Luca Bergammaschi, Angeles Martinez and John Pearson).
- Fast (1+x)-order methods for linear programming problems (2020-2021) Google Research Award, Google, Paris, France.

Awards

- **EUROPT 2019 Fellow**

Elected

- **Mathematical Optimization Society Council Member-at-Large** (2015-2018)

Editorships

- Member, Editorial Board: **Computational Management Science** (2002-2009) **(flyer)**
- Member, Editorial Board: **Computational Optimization and Applications** (2001-present)
- Member, Editorial Board: **European Journal of Operational Research** (2015-2023)
- Member, Editorial Board: **Mathematical Programming Computation** (2008-present)
- Member, Editorial Board: **Optimization Methods and Software** (2013-present)

Referee for:

- ACM Transactions on Mathematical Software,
- Annals of Operations Research,
- Archives of Control Sciences,
- Computational Management Science,
- Computational Optimization and Applications,
- Control and Cybernetics,
- European Journal of Operational Research,
- Journal of Optimization Theory and Applications,
- Management Science,
- Mathematical Programming,
- Mathematics of Operations Research,
- Optimization,
- Optimization and Engineering,
- Parallel Computing,
- SIAM Journal on Matrix Analysis and Applications,
- SIAM Journal on Optimization,
- SIAM Journal on Scientific Computing,
- The Journal of Supercomputing.

Software

- **HOPDM**, Higher-Order Primal-Dual Method for LP, QP, NLP.
- **OOPS**, Object-Oriented Parallel Solver for LP, QP, NLP.
- **PDCGM** Primal-Dual Column Generation Method.

Completed project

- **EPSRC: Mathematics for Vast Digital Resources**

Publications

Papers in refereed journals:

prepared in 1990:

1. **J. Gondzio and A. Ruszczynski**, A sensitivity method for basis inverse representation in multistage stochastic linear programming problems, *Journal of Optimization Theory and Applications* 74 (1992), 221-242.
2. **J. Gondzio**, Stable algorithm for updating dense LU factorization after row or column exchange and row and column addition or deletion, *Optimization* 23 (1992) 7-26.
3. **J. Gondzio**, On exploiting original problem data in the inverse representation of linear programming bases, *ORSA Journal on Computing* 6 (1994) No 2, 193-206.

prepared in 1991:

1. **J. Gondzio**, Splitting dense columns of constraint matrix in interior point methods for large scale linear programming, *Optimization* 24 (1992), 285-297.
2. **J. Gondzio**, Implementing Cholesky factorization for interior point methods of linear programming, *Optimization* 27 (1993) 121-140.
3. **J. Gondzio and D. Tachat**, The design and application of IPMLO - a FORTRAN library for linear optimization with interior point methods, *RAIRO Recherche Operationnelle* 28 (1994) No 1, 37-56.

prepared in 1992:

1. **A. Altman and J. Gondzio**, An efficient implementation of a higher order primal-dual interior point method for large sparse linear programs, *Archives of Control Sciences* 2 (1992) No 1/2, 23-40.
2. **A. Altman and J. Gondzio**, HOPDM - A higher order primal-dual method for large scale linear programming. *European Journal of Operational Research* 66 (1993) 159-161.
3. **J. Gondzio and M. Makowski**, Solving a class of LP problems with a primal-dual logarithmic barrier method, *European Journal of Operational Research* 80 (1995) 184-192.

prepared in 1993:

1. **J. Gondzio**, Another simplex-type method for large scale linear programming, *Control and Cybernetics* 25 (1996) No 4, 739-760.

prepared in 1994:

1. **J. Gondzio**, Presolve analysis of linear programs prior to applying an interior point method, *INFORMS Journal on Computing* 9, No 1, Winter 1997, 73-91.
2. **J.-L. Goffin, J.Gondzio, R. Sarkissian and J.-P. Vial**, Solving nonlinear multicommodity flow problems by the analytic center cutting plane method, *Mathematical Programming* 76 (1996) No 1, 131-154.
3. **J. Gondzio**, Multiple centrality corrections in a primal dual method for linear programming, *Computational Optimization and Applications* 6 (1996) 137-156.

prepared in 1995:

1. **J. Gondzio**, HOPDM (version 2.12) - A Fast LP Solver Based on a Primal-Dual Interior Point Method, *European Journal of Operational Research* 85 (1995) 221-225.
2. **J. Gondzio, R. Sarkissian and J.-P. Vial**, Using an Interior Point Method for the Master Problem in a Decomposition Approach, *European Journal of Operational Research* 101 (1997) 577-587.
3. **J. Gondzio, O. du Merle, R. Sarkissian and J.-P. Vial**, ACCPM - A Library for Convex Optimization Based on an Analytic Center Cutting Plane Method, *European Journal of Operational Research* 94 (1996) 206-211.

prepared in 1996:

1. **J. Gondzio**, Warm Start of the Primal-Dual Method Applied in the Cutting Plane Scheme, *Mathematical Programming* 83 (1998) No 1, 125-143.

prepared in 1997:

1. **J. Gondzio and J.-P. Vial**, Warm Start and Epsilon-subgradients in the Cutting Plane Scheme for Block-angular Linear Programs, *Computational Optimization and Applications* 14 (1999) 17-36.
2. **E. Fragniere, J. Gondzio R. Sarkissian and J.-P. Vial**, Structure Exploiting Tool in Algebraic Modeling Languages, *Management Science* 46 (2000) 1145-1158.

prepared in 1998:

1. **A. Altman and J. Gondzio**, Regularized Symmetric Indefinite Systems in Interior Point Methods for Linear and Quadratic Optimization, *Optimization Methods and Software* 11-12 (1999) No 1-4, 275-302.
2. **J. Gondzio, R. Sarkissian and J.-P. Vial**, Parallel Implementation of a Central Decomposition Method for Solving Large Scale Planning Problems, *Computational Optimization and Applications* 19 (2001) No 1, 5-29.
3. **E. Fragniere, J. Gondzio and J.-P. Vial**, Building and Solving Large-scale Stochastic Programs on an Affordable Distributed Computing System, *Annals of Operations Research* 99 (2000) No 1-4, 167-187.
4. **E. Fragniere, J. Gondzio and R. Sarkissian**, Efficient Management of Multiple Sets to Extract Complex Structures from Mathematical Programs, *Annals of Operations Research* 104 (2001) No 1-4, 67-87.

prepared in 1999:

1. **J. Gondzio and R. Kouwenberg**, High Performance Computing for Asset Liability Management, *Operations Research* 49 (2001) No 6, 879-891.

prepared in 2000:

1. **J. Gondzio, R. Kouwenberg and T. Vorst**, Hedging options under transaction costs and stochastic volatility, *Journal of Economic Dynamics and Control* 27 (2003) No 6, 1045-1068.
2. **J. Gondzio and R. Sarkissian**, Parallel interior point solver for structured linear programs, *Mathematical Programming* 96 (2003) No 3, 561-584.

prepared in 2001:

1. **J. Gondzio and A. Grothey**, Reoptimization with the primal-dual interior point method, *SIAM Journal on Optimization* 13 (2003) No 3, pp. 842-864.

prepared in 2002:

1. **L. Bergamaschi, J. Gondzio and G. Zilli**, Preconditioning Indefinite Systems in Interior Point Methods for Optimization, *Computational Optimization and Applications* 28 (2004) No 2, pp. 149-171.
   Received the 2004 COAP Best Paper Award.

prepared in 2003:

1. **V. Ejov, J. Filar and J. Gondzio**, An Interior Point Heuristic for the Hamiltonian Cycle Problem via Markov Decision Processes, *Journal of Global Optimization* 29 (2004) No 3, pp. 315-334.
2. **J. Gondzio and A. Grothey**, Parallel Interior Point Solver for Structured Quadratic Programs: Application to Financial Planning Problems, *Annals of Operations Research* 152 (2007) No 1, pp. 319-339.

prepared in 2004:

1. **J. Gondzio and A. Grothey**, Solving Nonlinear Portfolio Optimization Problems with the Primal-Dual Interior Point Method, *European Journal of Operational Research* 181 (2007) No 3, pp. 1019-1029.
2. **F.P. Ganneau, F.J. Ulm, J. Gondzio and E.J. Garboczi**, An algorithm for computing the compressive strength of heterogeneous cohesive-frictional materials - Application to cement paste,

Computers and Geotechnics 34 (2007) No 4, pp. 254-266.
3. **J. Gondzio and A. Grothey**, Exploiting Structure in Parallel Implementation of Interior Point Methods for Optimization, *Computational Management Science* 6 (2009) pp. 135–160.

prepared in 2005:

1. **L. Bergamaschi, J. Gondzio, M. Venturin and G. Zilli**, Inexact Constraint Preconditioners for Linear Systems Arising in Interior Point Methods, *Computational Optimization and Applications* 36 (2007) No 2-3, pp. 137-147.
See the Erratum (9 June 2008) COAP 49 (2011) pp. 401-406.
2. **M. Colombo and J. Gondzio**, Further Development of Multiple Centrality Correctors for Interior Point Methods, *Computational Optimization and Applications* 41 (2008) No 3, pp. 277-305.

prepared in 2006:

1. **G. Al-Jeiroudi, J. Gondzio and J.A.J. Hall**, Preconditioning Indefinite Systems in Interior Point Methods for Large Scale Linear Optimization, *Optimization Methods and Software* 23 (2008) No 3, pp. 345-363.
2. **J. Gondzio and A. Grothey**, A New Unblocking Technique to Warmstart Interior Point Methods based on Sensitivity Analysis, *SIAM Journal on Optimization* 19 (2008) No 3, pp. 1184-1210.
3. **M. Colombo, J. Gondzio and A. Grothey**, A Warm-Start Approach for Large-Scale Stochastic Linear Programs, *Mathematical Programming* 127 (2011) 371-397.

prepared in 2007:

1. **G. Al-Jeiroudi and J. Gondzio**, Convergence Analysis of Inexact Infeasible Interior Point Method for Linear Optimization, *Journal of Optimization Theory and Applications.* 141 (2009) pp. 231-247.
2. **S. Bellavia, J. Gondzio and B. Morini**, Regularization and Preconditioning of KKT Systems Arising in Nonnegative Least-Squares Problems, *Numerical Linear Algebra with Applications* 16 (2009) pp. 39-61.
3. **A. Pages, J. Gondzio and N. Nabona**, Warmstarting for Interior Point Methods Applied to the Long-Term Power Planning Problem, *European Journal on Operational Research* 197 (2009) pp. 112-125.
4. **J. Goncalves, R.H. Storer and J. Gondzio**, A Family of Linear Programming Algorithms Based on an Algorithm by von Neumann, *Optimization Methods and Software* 24 (2009) pp. 461–478.
5. **E. Fragniere, J. Gondzio and X. Yang**, Operations Risk Management by Optimally Planning the Qualified Workforce Capacity, *European Journal on Operational Research* 202 (2010) pp. 518-527.
6. **K. Woodsend and J. Gondzio**, Exploiting Separability in Large Scale Linear Support Vector Machine Training, *Computational Optimization and Applications* 49 (2011) 241–269.

prepared in 2008:

1. **H. Du, P.-J. Chung, J. Gondzio and B. Mulgrew**, Robust Transmit Beamforming Based on Probabilistic Constraint, Technical Report ERGO-08-002, School of Mathematics, The University of Edinburgh, January 24, 2008, revised May 31, 2008. (abstract and PDF). Presented at: *EUSIPCO-2008.* August 25-29, 2008, Lausanne, Switzerland.
2. **P.-J. Chung, H. Du and J. Gondzio**, A Probabilistic Constraint Approach for Robust Transmit Beamforming with Imperfect Channel Information, Technical Report ERGO-08-003, School of Mathematics, The University of Edinburgh, September 29, 2008. (abstract and PDF). Presented at: *EUSIPCO-2009.* August 24--28, 2009, Glasgow, UK.

prepared in 2009:

1. **K. Woodsend and J. Gondzio**, Hybrid MPI/OpenMP Parallel Linear Support Vector Machine Training, *Journal of Machine Learning Research* 20 (2009) pp 1937-1953.
2. **M. Colombo, A. Grothey, J. Hogg, K. Woodsend and J. Gondzio**, A Structure-conveying Modelling Language for Mathematical and Stochastic Programming, *Mathematical Programming Computation* 1 (2009) pp 223–247.
3. **X. Yang, J. Gondzio and A. Grothey**, Asset-Liability Management Modelling with Risk Control by Stochastic Dominance, *Journal of Asset Management* 11 (2010) pp 73-93.

4. **S. Bellavia, J. Gondzio and B. Morini**, Computational Experience with Numerical Methods for Nonnegative Least-Squares Problems, *Numerical Linear Algebra with Applications* 18 (2011) pp. 363-385.
5. **J. Gondzio**, Matrix-Free Interior Point Method, *Computational Optimization and Applications* 51 (2012) pp. 457-480. Published online October 14, 2010: DOI 10.1007/s10589-010-9361-3.

prepared in 2010:

1. **E. Fragniere, J. Gondzio, N. S. Tuchschmid and Qun Zhang**, Non-parametric Liquidity Adjusted VaR Model: A Stochastic Programming Approach, *Journal of Financial Transformation* 28 (2010) pp 111-118. Final PDF.
2. **P.-J. Chung, H. Du and J. Gondzio**, A Probabilistic Constraint Approach for Robust Transmit Beamforming with Imperfect Channel Information, *IEEE Transactions on Signal Processing* 59 (2011) No 6, 2773-2782.

prepared in 2011:

1. **J. Gondzio**, Interior point methods 25 years later, *European Journal of Operational Research* 218 (2012) pp. 587-601. Published online: October 8, 2011. DOI 10.1016/j.ejor.2011.09.017.
2. **J. Gondzio, P. González-Brevis, P. Munari**, New Developments in the Primal-Dual Column Generation Technique, *European Journal of Operational Research* 224 (2013) 41-51. Published online: July 31, 2012. DOI 10.1016/j.ejor.2012.07.024.
3. **S. Bellavia, J. Gondzio and B. Morini**, A Matrix-Free Preconditioner for Sparse Symmetric Positive Definite Systems and Least-Squares Problems, *SIAM Journal on Scientific Computing* 35 (2013) No 1, pp. A192-A211.

prepared in 2012:

1. **P. Munari and J. Gondzio**, Using the Primal-Dual Interior Point Algorithm within the Branch-Price-and-Cut Method, *Computers and Operations Research* 40 (2013) No 8, pp. 2026–2036.
2. **J. Gondzio**, Convergence Analysis of an Inexact Feasible Interior Point Method for Convex Quadratic Programming, *SIAM Journal on Optimization* 23 (2013) No 3, pp. 1510-1527.
3. **K. Fountoulakis, J. Gondzio and P. Zhlobich**, Matrix-free Interior Point Method for Compressed Sensing Problems, *Mathematical Programming Computation* 6 (2014), pp. 1-31.
4. **J. Gondzio, J. Gruca, J.A.J. Hall, W. Laskowski and M. Zukowski**, Solving Large-Scale Optimization Problems Related to Bell's Theorem, *Journal of Computational and Applied Mathematics* 263C (2014), pp. 392-404.

prepared in 2013:

1. **J. Gondzio and P. González-Brevis**, A New Warmstarting Strategy for the Primal-Dual Column Generation Method, *Mathematical Programming A* 152 (2015) 113--146.
2. **J. Gondzio, P. González-Brevis and P. Munari**, Large-scale Optimization with the Primal-Dual Column Generation Method. *Mathematical Programming Computation* 8 (2016) 47--82.
3. **R. Tappenden, P. Richtarik and J. Gondzio**, Inexact Coordinate Descent: Complexity and Preconditioning, *Journal of Optimization Theory and Applications* 170 (2016) No 1, 144--176.

prepared in 2014:

1. **K. Fountoulakis and J. Gondzio**, A Second-Order Method for Strongly Convex L1-Regularization Problems, *Mathematical Programming A* 156 (2016) 189-219.
2. **I. Dassios, K. Fountoulakis and J. Gondzio**, A Preconditioner for a Primal-dual Newton Conjugate Gradients Method for Compressed Sensing Problems, *SIAM Journal on Scientific Computing* 37 (2015) A2783--A2812.

prepared in 2015:

1. **K. Fountoulakis and J. Gondzio**, Performance of First- and Second-Order Methods for L1-regularized Least Squares Problems, *Computational Optimization and Applications* 65 (2016) 605-

-635.
Reports on the solution of the optimization problem with 1 trillion (10^{12}) variables.

2. **J. Gondzio**, Crash Start of Interior Point Methods, *European Journal of Operational Research* 255 (2016) 308--314.

prepared in 2016:

1. **J.W. Pearson and J. Gondzio**, Fast Interior Point Solution of Quadratic Programming Problems Arising from PDE-Constrained Optimization, *Numerische Mathematik* 137 (2017), 4, pp. 959--999.
2. **S. Bellavia, J. Gondzio and M. Porcelli**, An Inexact Dual Logarithmic Barrier Method for Solving Sparse Semidefinite Programs, *Mathematical Programming A* 178 (2019) pp. 109--143.

prepared in 2017:

1. **A.G. Weldeyesus and J. Gondzio**, A Specialized Primal-Dual Interior Point Method for the Plastic Truss Layout Optimization, *Computational Optimization and Applications* 71 (2018) pp. 613--640.
2. **P. Munari, A. Moreno, J. De La Vega, D. Alem, J. Gondzio and R. Morabito**, The Robust Vehicle Routing Problem with Time Windows: Compact Formulation and Branch-Price-and-Cut Method, *Transportation Science* 53, No 4 (2019) pp. 917--1212.

prepared in 2018:

1. **S. Pougkakiotis and J. Gondzio**, Dynamic non-diagonal regularization in interior point methods for linear and convex quadratic programming, *Journal of Optimization Theory and Applications* 181 (2019) pp. 905--945.
2. **M. Delorme, S. Garcia, J. Gondzio, J. Kalcsics, D. Manlove and W. Pettersson**, Mathematical models for stable matching problems with ties and incomplete lists, *European Journal of Operational Research* 277 (2019) pp. 426--441.
3. **J. Gondzio and F. Sobral**, Quasi-Newton approaches to interior point methods for quadratic problems, *Computational Optimization and Applications* 74 (2019) pp. 93--120.
4. **L. Schork and J. Gondzio**, Rank revealing Gaussian Elimination by the maximum volume concept, *Linear Algebra and its Applications* 592 (2020) pp. 1--19.
5. **L. Schork and J. Gondzio**, Implementation of an interior point method with basis preconditioning, *Mathematical Programming Computation* 12 (2020) pp. 603--635.
6. **J. Gondzio and E. A. Yildirim**, Global solutions of nonconvex standard quadratic programs via mixed integer linear programming reformulations, *Journal of Global Optimization* 81 (2021) pp. 293--321.

prepared in 2019:

1. **A.G. Weldeyesus, J. Gondzio, L. He, M. Gilbert, P. Shepherd and A. Tyas**, Adaptive solution of truss layout optimization problems with global stability constraints, *Structural and Multidisciplinary Optimization* 60 No 5 (2019) pp. 2093--2111.
2. **A.G. Weldeyesus, J. Gondzio, L. He, M. Gilbert, P. Shepherd, A. Tyas**, Truss geometry and topology optimization with global stability constraints, *Structural and Multidisciplinary Optimization* 62 (2020) pp. 1721--1737.
3. **S. Pougkakiotis, J. W. Pearson, S. Leveque and J. Gondzio**, Fast solution methods for convex fractional differential equation optimization, *SIAM Journal on Matrix Analysis and Applications* 41 No 3 (2020) pp. 1443--1476.
4. **S. Pougkakiotis and J. Gondzio**, An interior point-proximal method of multipliers for convex quadratic programming, *Computational Optimization and Applications* 78 (2021) pp. 307--351.
5. **L. Bergamaschi, J. Gondzio, A. Martinez, J. Pearson, S. Pougkakiotis**, A New Preconditioning Approach for an Interior Point--Proximal Method of Multipliers for Linear and Convex Quadratic Programming, *Numerical Linear Algebra with Applications* 28 No 4 (2021).
6. **S. Bellavia, J. Gondzio, M. Porcelli**, A relaxed interior point method for low-rank semidefinite programming problems with applications to matrix completion, *Journal of Scientific Computing* 89

(2021) No 46.
(accepted: 18 August 2021, published online: 11 October 2021).

prepared in 2020:

1. **M. Barkhagen, S. García, J. Gondzio, J. Kalcsics, J. Kroeske, S. Sabanis and A. Staal**, Optimising portfolio diversification and dimensionality, *Journal of Global Optimization* (accepted: 19 April 2022, published online: 2 July 2022).
2. **W. Pettersson, M. Delorme, S. Garcia, J. Gondzio, J. Kalcsics and D. Manlove**, Improving solution times for stable matching problems through preprocessing, *Computers and Operations Research* 128 (2021) 105128.
3. **M. Delorme, S. Garcia, J. Gondzio, J. Kalcsics, D. Manlove and W. Pettersson**, Stability in the Hospitals / Residents problem with Couples and Ties: Mathematical models and computational studies, *Omega* 103 (2021) 102386.
4. **S. Pougkakiotis and J. Gondzio**, An interior point-proximal method of multipliers for linear positive semidefinite programming, *Journal of Optimization Theory and Applications* 192 (2022) 97--129.
5. **M. Delorme, S. Garcia, J. Gondzio, J. Kalcsics, D. Manlove and W. Pettersson**, New algorithms for hierarchical optimisation in kidney exchange programmes, *Operations Research* (accepted: 22 August 2022, published online: ? 2022).

prepared in 2021:

1. **V. De Simone, D. di Serafino, J. Gondzio, S. Pougkakiotis and M. Viola**, Sparse Approximations with Interior Point Methods, *SIAM Review* 64 (2022) No 4, 954--988.
(accepted: 24 November 2021, published online: 3 November 2022).
2. **J. Gondzio, S.-M. Latva-Äijö, S. M. Siltanen, M. Lassas and F. Zanetti**, Material-separating regularizer for multi-energy X-ray tomograph, *Inverse Problems* 38 (2022) No 2, 025013.
(accepted: 8 December 2021, published online: 5 January 2022).
3. **M. Delorme, S. Garcia, J. Gondzio, J. Kalcsics, D. Manlove, W. Pettersson and J. Trimble**, Improved instance generation for kidney exchange programmes, *Computers and Operations Research*
(accepted: 9 January 2022, published online: 21 January 2022).
4. **S. Salt, A. Weldeyesus, M. Gilbert and J. Gondzio**, Layout optimization of pin-jointed truss structures with minimum frequency constraints, *Engineering Optimization*
(accepted: 25 March 2022, published online: 17 July 2022).
5. **S. Cipolla and J. Gondzio**, Training very large scale nonlinear SVMs using Alternating Direction Method of Multipliers coupled with the Hierarchically Semi-Separable kernel approximations, *EURO Journal on Computational Optimization*
(accepted: 3 October 2022, published online: 18 October 2022).
6. **J. Gondzio, S. Pougkakiotis and J.W. Pearson**, General-purpose preconditioning for regularized interior point methods, *Computational Optimization and Applications*
(accepted: 5 October 2022, published online: 14 November 2022).
7. **F. Zanetti and J. Gondzio**, A New Stopping Criterion for Krylov Solvers applied in Interior Point Methods, *SIAM Journal on Scientific Computing*
(accepted: 20 October 2022).

Other publications:

1. **J. Gondzio and T. Terlaky**, A Computational View of Interior Point Methods for Linear Programming, in: *Advances in Linear and Integer Programming*, J. Beasley (ed.), Chapter 3, pp 103-144, Oxford University Press, Oxford, England 1996. See the book.

2. **E.D. Andersen, J. Gondzio, C. Meszaros and X. Xu**, Implementation of Interior Point Methods for Large Scale Linear Programming, in: *Interior Point Methods in Mathematical Programming*, T. Terlaky (ed.), Chapter 6, pp. 189-252, Kluwer Academic Publisher, 1996. See the book and an old version of the TR 1996.3 (PS file).

3. **E. Fragniere, J. Gondzio and R. Sarkissian**, Customized Block Structures in Algebraic Modeling Languages: The Stochastic Programming Case, *Proceedings of the IFAC Symposium on Computation in Economics, Finance and Engineering: Economics Systems, CEFES/IFAC98*, Sean Holly (ed.), pp. 141-144, Springer Verlag, Berlin, 2000. TR (PS file, 4MB).

4. **J.A. Filar, J. Gondzio, A. Haurie A, et al.**, Decomposition and Parallel Processing Techniques for Two-time Scale Controlled Markov Chains, *Proceedings of the 39th IEEE Conference on Decision and Control,* Vols 1-5, pp. 711-716, 2000.

5. **E. Fragniere and J. Gondzio**, Optimization Modeling Languages, in: P. Pardalos and M. Resende (eds.), *Handbook of Applied Optimization*, Oxford University Press, June 2002, pp. 993-1007. See the book and an old version of the TR (PDF file).

6. **E. Fragniere and J. Gondzio**, Stochastic Programming from Modeling Languages, in: S. Wallace and W. Ziemba (eds.) *Applications of Stochastic Programming*, SIAM Series on Optimization, 2005, Chapter 7, pp. 95-113. See the book and an old version of the TR (PDF file).

7. **J. Gondzio and A. Grothey**, Direct Solution of Linear Systems of Size 10^9 Arising in Optimization with Interior Point Methods, R. Wyrzykowski, J. Dongarra, N. Meyer and J. Wasniewski (eds.), Parallel Processing and Applied Mathematics PPAM 2005, *Lecture Notes in Computer Science*, **3911**, Springer-Verlag, Berlin, 2006, pp 513-525. TR (PDF file).
   Reports on the solution of the optimization problem with 1 billion (10^9) variables.

8. **J. Gondzio and A. Grothey**, Solving Nonlinear Financial Planning Problems with 10^9 Decision Variables on Massively Parallel Architectures, M. Costantino, C.A. Brebbia (eds.), Computational Finance and its Applications II, *WIT Transactions on Modelling and Simulation*, **43**, WIT Press, 2006. (abstract, PDF).

9. **K. Woodsend and J. Gondzio**, High-Performance Parallel Support Vector Machine Training, R. Ciegis, D. Henty, B. Kagstrom, J. Zilinskas (eds.), Parallel scientific computing and optimization: advances and applications. Springer optimization and its applications, vol **27**, Springer, Berlin, 2009, pp 83–92.

10. **A. Grothey, J. Hogg, K. Woodsend, M. Colombo and J. Gondzio**, A structure-conveying parallelisable modelling language for mathematical programming, R. Ciegis, D. Henty, B. Kagstrom, J. Zilinskas (eds.), Parallel scientific computing and optimization: advances and applications. Springer optimization and its applications, vol **27**, Springer, Berlin, 2009, pp 147–158.

11. **J. Gondzio**, Interior point methods in machine learning, *Optimization for Machine Learning*, S. Sra, S. Nowozin and S. Wright (eds), MIT Press, 2010. (abstract, PDF).

12. **E. Smith, J. Gondzio and J.A.J. Hall**, GPU acceleration of the matrix-free interior point method, R. Wyrzykowski, J. Dongarra, K. Karczewski and J. Wasniewski (eds.), Parallel Processing and Applied Mathematics PPAM 2011, Part I, *Lecture Notes in Computer Science*, **7203**, Springer-Verlag, Berlin, 2012, pp 681-689.

Selected technical reports:

1. **J. Gondzio**, Applying Schur Complements for Handling General Updates of a Large, Sparse, Unsymmetric Matrix, Technical Report ZTSW-2-G244/93 Systems Research Institute, Polish Academy of Sciences, Warsaw, Poland, September 1993, revised in April 1995. (PDF file).
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2. **S. Pougkakiotis and J. Gondzio**, An interior point-proximal method of multipliers for positive semidefinite programming, *Journal of Optimization Theory and Applications* (accepted: 18 Sept 2021).
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