

6th IMA Conference on Numerical Linear Algebra and Optimization
Wednesday 27 – Friday 29 June 2018, University of Birmingham

PROGRAMME

Wednesday 27 June

08:15	Registration	
08:45 – 09:00	Welcome	
09:00 – 09:50	Plenary Talk: Iterative Methods with an Error Minimization Property Dominique Orban (Polytechnique Montréal) – NAG invited speaker	
	Lecture Theatre A	Lecture Theatre C
	Minisymposium: Software for Numerical Linear Algebra and Optimization	Minisymposium: Grid-free Sparse Inverse Problems
10:00 – 10:20	IR Tools - A MATLAB package of Iterative Regularization Methods and Large-Scale Test Problems J. Nagy (Emory University)	Spectral Compressed Sensing via Projected Gradient Descent K. Wei (Fudan University, Shanghai)
10:20 – 10:40	AIR Tools II - A MATLAB toolbox of algebraic iterative reconstruction methods for CT J. Sauer Jorgensen (University of Manchester)	On the Spectral Resolution Limits of TV-Regularization M. Ferreira Da Costa, W. Dai (Imperial College London)
10:40 – 11:00	Tea/Coffee break	
	Lecture Theatre A	Lecture Theatre C
	Minisymposium: Software for Numerical Linear Algebra and Optimization	Minisymposium: Grid-free Sparse Inverse Problems
11:00 – 11:20	Chordal Matrix Algorithms for Convex Optimization M. Skovgaard Andersen (DTU Compute)	Sparse non-negative super-resolution -- simplified and stabilized B. Toader (University of Oxford)
11:20 – 11:40	An object-oriented MATLAB framework for inverse problems M. Benning (University of Cambridge)	Equivalence of the Conditional Gradient and Exchange Methods A. Thompson (University of Oxford)
11:40 – 12:30	Plenary Talk: Regularization and Compression via Tensor Dictionaries Misha Kilmer (Tufts University)	
12:30 – 14:00	Lunch	
14:00 – 14:50	Plenary Talk: Practical Conditional Gradient Algorithms Steve Wright (University of Wisconsin) – Turing Lecture	
	Lecture Theatre A	Lecture Theatre C
	Contributed talks	Contributed talks
15:00 – 15:20	A new and simpler approach to the analysis of Robust PCA S. Chrétien (National Physical Laboratory) and T. Wei	Convergence of hybrid LSQR and RSVD Algorithms for ill-posed least squares problems R. A. Renaut, Anthony Helmstetter (Arizona State University) and S. Vatankeh (University of Tehran)

15:20 – 15:40	Fast Bregman-based first-order algorithms for non-negative linear inverse problems S. Petra (Heidelberg University)	Minisymposium: Modern methods for least-squares fitting Iterative Solution of Sparse Linear Least Squares using LU Factorization M. Baboulin (Laboratoire de Recherche en Informatique, Paris) and G. Howell (North Carolina State University)
15:40 – 16:00	Accelerating linear systems solution by exploiting low-rank approximations to factorization error N. J. Higham and T. Mary (University of Manchester)	Scaling Up Gauss-Newton Methods for Expensive Least-Squares Problems J. Fowkes and C. Cartis (University of Oxford)
16:00 – 16:20	Tea/Coffee break	
	Lecture Theatre A Contributed talks	Lecture Theatre C Minisymposium: Modern methods for least-squares fitting
16:20 – 16:40	Advances in fitting concentric objects to digitized data A. Al-Sharadqah (California State University Northridge)	RALFit: A higher order nonlinear least-squares solver T. Rees (STFC-RAL), N. Gould and J. Scott
16:40 – 17:00	Performance bounds for co-/sparse box constrained signal recovery J. Kuske and S. Petra	Improving the efficiency of derivative-free methods for nonlinear least squares problems L. Roberts (University of Oxford) C. Cartis, J. Fiala and B. Marteau
17:00 – 17:20	An inner-outer iterations approach based on the Golub-Kahan bidiagonalisation for blockstructured indefinite linear systems C. Kruse (Cerfacs), M. Arioli (Libera Università Mediterranea), N. Tardieu (EDF R&D)	The challenge of sparse-dense linear least-squares problems J. Scott (STFC-RAL) and M. Tůma (Charles University, Czech Republic)
17:20 – 17:40	Call Center's Optimization Problem M. Ali (University of the Witwatersrand)	Sparsification by stretching in linear least-squares problems M. Tůma (Charles University, Czech Republic) and J. Scott (STFC-RAL)
18:30 – 19:30	Drinks Reception with canapés – Michael Tippett Room, Staff House	

Thursday 28 June

09:00 – 09:50	Plenary Talk: High performance numerical linear algebra for the revised simplex method Julian Hall (University of Edinburgh)	
	Lecture Theatre A Minisymposium: tractable and scalable global optimisation and applications	Lecture Theatre C Minisymposium: Matrix Functions and Quadrature Rules with Applications to Complex Networks
10:00 – 10:20	Dimensionality reduction techniques for global optimization A. Otemissov (Turing Institute and University of Oxford) and C. Cartis (University of Oxford)	Small updates of matrix functions used for network centrality F. Tudisco (University of Strathclyde)
10:20 – 10:40	Manifold lifting: problems and methods F. Goyens (Turing Institute and University of Oxford), C. Cartis (University of Oxford), A. Eftekhari (Turing Institute) and Greg Ongie (University of Michigan)	Look-ahead Lanczos, Gauss quadrature and minimal partial realization S. Pozza (Charles University in Prague)
10:40 – 11:00	Tea/Coffee break	
	Lecture Theatre A Minisymposium: tractable and scalable global optimisation and applications	Lecture Theatre C Minisymposium: Matrix Functions and Quadrature Rules with Applications to Complex Networks
11:00 – 11:20	Heuristics with Performance Guarantees for the minimum number of matches problem in heat recovery network design D. Letsios, G. Kouyialis and R. Misener (Imperial College London)	The action of the weighted geometric mean on a vector M. Fasi (University of Manchester)
11:20 – 11:40	Stochastic variants of classical optimization methods, with global rates of convergence to first- and second-order critical points C. Cartis (University of Oxford) and K. Scheinberg (Lehigh University)	Don't walk back in anger V. Noferini (University of Essex)
11:40 – 12:30	Plenary Talk: A Multilevel Preconditioner for Data Assimilation with 4D-Var Alison Ramage (University of Strathclyde)	
12:30 – 14:00	Lunch	
14:00 – 14:50	Plenary Talk: Globally Solving the Trust Region Subproblem Using Simple First-Order Methods Amir Beck (Tel Aviv University)	
	Lecture Theatre A Contributed talks	Lecture Theatre C Contributed talks
15:00 – 15:20	A spectrally preconditioned and initially deflated variant of the restarted block GMRES method for solving multiple right-hand sides linear systems B. Carpentieri, S. Naveed (Free University of Bozen-Bolzano), D. Sun, T. Huang and Y. Jing (University of Electronic Science and Technology of China)	Robust preconditioning techniques for the Stokes-Darcy problem M. Discacciati (Loughborough University)

15:20 – 15:40	Using tropical optimization in rank-one approximation of positive matrices N. Krivulin (St. Petersburg State University)	Accelerating the simplex algorithm via novel crash procedures N. Ploskas, N. V. Sahinidis, N. Samaras
15:40 – 16:00		A quadratic penalty algorithm for linear programming I. Galabova
16:00 – 16:20	Tea/coffee break	
	Lecture Theatre A Contributed talks	Lecture Theatre C Contributed talks
16:20 – 16:40	Superlinear convergence of the GMRES for PDE-constrained optimization problems O. Axelsson (Institute of Geonics AS CR) and J. Karátson (ELTE University)	On deflation process and solving the quadratic eigenvalue problems I. Sain Glibic (University of Zagreb)
16:40 – 17:00	An efficient primal-dual interior point method for large-scale truss layout optimization problems J. Gondzio and A. Weldeyesus (University of Edinburgh)	Complexity guarantees and numerical behavior of Newton-type methods for smooth nonconvex optimization M. O'Neill, C. Royer and S. Wright (University of Wisconsin-Madison)
17:00 – 17:20	Non-diagonal dynamic regularization for Interior Point Methods S. Pougkakiotis and J. Gondzio (University of Edinburgh)	Adventures in Half Precision Arithmetic P. Blanchard, T. Mary and N. Higham (University of Manchester)
17:20 – 17:40	Preconditioners for boundary control of PDE D. Loghin (University of Birmingham)	A non-symmetric cone programming approach to sum-of-squares optimization D. Papp (North Carolina State University)

Friday 29 June

09:00 – 09:50	Plenary Talk: Model-Based Methods, Sampling Models, and A New Hessian Free Second-Order Model-Based Method Luís Nunes Vicente (University of Coimbra)	
	Lecture Theatre A Contributed talks	Lecture Theatre C Minisymposium: Semidefinite programming and polynomial optimization
10:00 – 10:20	Node and layer eigenvector centralities for multiplex networks F. Arrigo, F. Tudisco (University of Strathclyde) and A. Gautier (Saarland University)	Chordal decomposition in operator-splitting methods for sparse semidefinite programs A. Papachristodoulou (Oxford, Engineering)
10:20 – 10:40	A preconditioned iterative solver for efficient computational simulation of random networks of fibres M. Houghton (University of Leeds)	Scalable algorithms for the non-commutative Grothendieck problem J. Saunderson (Monash University, Australia)
10:40 – 11:00	Tea/Coffee break	

	Lecture Theatre A	Lecture Theatre C
	Minisymposium: Recent Advances in Low-Rank Methods	Minisymposium: Semidefinite programming and polynomial optimization
11:00 – 11:20	A Model for Mixed Linear–Tropical Matrix Factorization J. Hook (University of Bath), S. Karaev and P. Miettinen (Max Planck Institute for Informatics)	Towards a sharp degree bound for sum of squares nonnegativity certificates for quaternary quartics D. Pasechnik (Oxford, Computer Science)
11:20 – 11:40	Projected Newton-Kleiman Methods for the Algebraic Riccati Equation D. Palitta (University of Bologna)	Semidefinite approximations of the matrix logarithm H. Fawzi (University of Cambridge)
11:40 – 12:00	Inexact linear solves in low-rank methods for large-scale matrix equations P. Kurschner (MPI Magdeburg)	Minisymposium: Numerical aspects of PDE-constrained shape optimization Shape optimization for unsteady fluid-structure interaction J. Haubner and M. Ulbrich
12:00 – 12:20	A low-rank approach to the solution of weak constraint variational data assimilation problems M. Freitag (University of Bath)	A robust and efficient adaptive multigrid solver for shape optimisation in cell motility A. Madzvamuse (University of Sussex)
12:20 – 13:20	Lunch	
	Lecture Theatre A	Lecture Theatre C
	Contributed Talks	Minisymposium: Numerical aspects of PDE-constrained shape optimization
13:20 – 13:40	Generalized block tuned preconditioners for SPD eigensolvers L. Bergamaschi, Á. Martínez (University of Padua)	Shape Optimisation With Nearly Conformal Mappings F. Wechsung (University of Oxford), J. A. Iglesias and K. Sturm
13:40 – 14:00		Multigrid algorithms for interface identification problems M. Siebenborn (University of Trier)
14:00 – 14:50	Plenary Talk: Nonlinear Eigenvalue Problems: Classical Results and Recent Developments Françoise Tisseur (University of Manchester)	
14:50 – 15:00	Close of conference	

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