

IMA Conference on Numerical Linear Algebra and Optimisation  
Wednesday 3 – Friday 5 September 2014, University of Birmingham

PROGRAMME

Wednesday 3 September

08:15	<i>Registration and refreshments available in Physics Bridge Room</i>	
08:50 – 09:00	Welcome – Lecture Theatre A	
09:00 – 09:50	Plenary Talk: Updating and Datedating Techniques for Networks Michele Benzi (Emory University) – Lecture Theatre A	
	Lecture Theatre A <i>Minisymposium: Innovative Techniques for the Analysis of Complex Networks</i>	Lecture Theatre C <i>Contributed talks</i>
09:50 – 10:15	On the radius of centrality in evolving networks <i>D. Vukadinović Greetham</i> (University of Reading)	Minimization of the quadratic function with a semidefinite Hessian with applications <i>Z. Dostál</i> and <i>L. Pospíšil</i> (VŠB-Technical University of Ostrava, Czech Republic)
10:15 – 10:40	Matching Exponential and Resolvent Based Centrality Measures in Complex Networks <i>M. Aprahamian</i> , <i>N. J. Higham</i> (University of Manchester) and <i>D. J. Higham</i> (University of Strathclyde)	On the properties of Krylov subspaces in finite precision CG computations <i>T. Gergelits</i> and <i>Z. Strakos</i> (Charles University in Prague)
10:40 – 11:00	<i>Tea/Coffee break – Physics Bridge Room</i>	
	Lecture Theatre A <i>Minisymposium: Innovative Techniques for the Analysis of Complex Networks</i>	Lecture Theatre C <i>Minisymposium: Preconditioning for PDEs and Optimization</i>
11:00 – 11:25	Majority Consensus: Algorithms and Spectral Optimisation <i>A. Babaee</i> (Imperial College London)	Preconditioners for 3-by-3 block saddle point matrices with applications to biharmonic problems <i>W. Zulehner</i> (Johannes Kepler University Linz)
11:25 – 11:50	<i>Contributed talk:</i> A Block GMRES-like algorithm for the simultaneous solution of shifted linear systems <i>K. M. Soodhalter</i> (Johannes Kepler University, Austria)	Updating constraint preconditioners for sequences of regularized KKT systems <i>V. De Simone</i> , <i>D. di Serafino</i> (Seconda Università degli Studi di Napoli), <i>S. Bellavia</i> and <i>B. Morini</i> (Università degli Studi di Firenze)
11:50 – 12:40	Plenary Talk: Interior Point Methods for Optimal Power Flow Andreas Grothey (University of Edinburgh) – Lecture Theatre A	
12:40 – 14:00	<i>Lunch - Physics Bridge Room</i>	
14:00 – 14:50	Plenary Talk: Theory and Applications of Nondiscrete Induction Joerg Liesen (TU Berlin) – Lecture Theatre A	
	Lecture Theatre A <i>Contributed talks</i>	Lecture Theatre C <i>Minisymposium: Preconditioning for PDEs and Optimization</i>
14:50 – 15:15	Nested Krylov methods for shifted linear systems <i>M. M. Baumann</i> (Delft University of Technology, Netherlands)	A preconditioner for discontinuous Galerkin discretizations with discontinuous coefficients <i>P. Krzyzanowski</i> (University of Warsaw)
15:15 – 15:40	<i>Talk by Lukas Adam</i>	Preconditioning of Primal-Dual Active-Set methods for PDE-constrained Optimal Control Problems <i>M. Porcelli</i> , <i>V. Simoncini</i> and <i>Mattia Tani</i> (Università di Bologna)
15:40 – 15:55	<i>Tea/Coffee break – Physics Bridge Room</i>	
	Lecture Theatre A <i>Contributed talks</i>	Lecture Theatre C <i>Minisymposium: Preconditioning for PDEs and Optimization</i>
15:55 – 16:20	Enhanced analysis of solvability of TLS problems with multiple right-hand sides <i>I. Hnětynková</i> , <i>M. Plešinger</i> , <i>Z. Strakoš</i> (Academy	Preconditioned Newton-like solvers for liquid crystal director models <i>A. Ramage</i> (University of Strathclyde)

	of Sciences of the Czech Republic)	
16:20 – 16:45	<b>Towards a parallel rational Arnoldi algorithm</b> <i>M. Berljafa</i> and <i>S. Güttel</i> (University of Manchester)	<b>Fast Multipole Preconditioning for Poisson and Stokes Problems</b> <i>R. Yokota, J. Pestana, H. Ibeid</i> and <i>D. Keyes</i> (University of Oxford)
16:45 – 17:10	<b>Short recurrences for computing extended Krylov bases for Hermitian and unitary matrices</b> <i>C. Mertens, R. Vandebril</i> (KU Leuven)	<b>Preconditioning Saddle Point Systems arising in Trust Region Methods</b> <i>S. Mach</i> (Technical University Chemnitz)
<b>17:10 – 17:30</b>	<b>Tea/Coffee break – Physics Bridge Room</b>	
	<b>Lecture Theatre A</b>  <b>Contributed talks</b>	<b>Lecture Theatre C</b> <b>Minisymposium: Preconditioning for PDEs and Optimization</b>
17:30 – 17:55	<b>Application of nonlinear filtering to reconstruction problem of three-dimensional railway track geometry and study on parameter optimization</b> <i>A. Yoshimura</i> (Tokyo University of Technology)	<b>Preconditioners For Higher Order Methods In Signal Reconstruction</b> <i>I. Dassios, K. Fountoulakis, and J. Gondzio</i> (University of Edinburgh)
17:55 – 18:20	<b>An implicit optimization approach for the Kaczmarz method applied to algebraic reconstruction techniques for computed tomography</b> <i>S. Bannasch, G. Warnecke, R. Frysich, T. Pfeiffer, G. Rose</i> (Otto-von-Guericke-University-Magdeburg)	<b>Unreduced symmetric KKT systems arising from interior point methods</b> <i>M. Tani</i> and <i>V. Simoncini</i> (Università di Bologna), <i>B. Morini</i> (Università di Firenze)
<b>19:00</b>	<b>Drinks Reception with canapés, Michael Tippet Room, Staff House</b>	

Thursday 4 September

09:00 – 09:50	<b>Plenary Talk: Primal-dual subgradient method for convex problems with functional constraints</b> <b>Yuri Nesterov (Université Catholique de Louvain)</b> – Lecture Theatre A	
	Lecture Theatre A <i>Contributed talks</i>	Lecture Theatre C <i>Minisymposium: Modern directions in matrix analysis and applications</i>
09:50 – 10:15	<b>Signed incomplete Cholesky factorization preconditioners for saddle-point systems</b> <i>J. Scott</i> (STFC Rutherford Appleton Laboratory)	<b>Repairing the Indefiniteness of a Correlation Matrix with a Fixed Block</b> <i>N. J. Higham, N. Strabic and V. Sego</i> (The University of Manchester)
10:15 – 10:40	<b>Preconditioning for various Cahn-Hilliard systems</b> <i>J. Bosch and M. Stoll</i> (Max Planck Institute for Dynamics of Complex Technical Systems)	<b>Fréchet Derivatives of Matrix Functions and Applications</b> <i>S. D. Relton and N. J. Higham</i> (The University of Manchester)
<b>10:40 – 11:00</b>	<b>Tea/Coffee break – Physics Bridge Room</b>	
	Lecture Theatre A <i>Contributed talks</i>	Lecture Theatre C <i>Minisymposium: Modern directions in matrix analysis and applications</i>
11:00 – 11:25	<b>Preconditioning the Helmholtz Equation using approximate Dirichlet-to-Neumann operators on optimal grids</b> <i>P. N. Childs</i> (Schlumberger Gould Research), <i>V. Druskin</i> (Schlumberger Doll Research) and <i>L. Knizhnerman</i> (Central Geophysical Expedition)	<b>Permuted graph bases for structured subspaces and pencils</b> <i>V. Mehrmann</i> (Technische Universität Berlin) and <i>F. Poloni</i> (Università di Pisa)
11:25 – 11:50	<b>Fast Solvers for PDE-Constrained Optimization</b> <i>J. Pearson</i> (University of Edinburgh)	<b>Compact rational Krylov methods for solving nonlinear eigenvalue problem</b> <i>R. Van Beeumen, K. Meerbergen and W. Michiels</i> (KU Leuven)
11:50 – 12:15	<b>A second-order method for <math>\ell_1</math>-regularized problems</b> <i>K. Fountoulakis and J. Gondzio</i> (University of Edinburgh)	<b>Fast Generation of Random Orthogonal Matrices</b> <i>N. J. Higham, A. Khabou and F. Tisseur</i> (University of Manchester)
12:15 – 12:40	<b>Levenberg-Marquardt and Adaptive Quadratic Regularized methods for ill-posed nonlinear systems</b> <i>S. Bellavia and B. Morini</i> (Università degli Studi di Firenze)	<i>Contributed talk:</i> <b>Optimization on structured matrix manifolds: Toeplitz and TBBT matrices</b> <i>B. Jeuris and R. Vandebril</i> (KU Leuven)
<b>12:40 – 14:00</b>	<b>Lunch - Physics Bridge Room</b>	
14:00 – 14:50	<b>Plenary Talk – The merits of keeping it smooth</b> – Lecture Theatre A <b>Michael Friedlander (University of British Columbia)</b> – NAG Distinguished Lecturer	
	Lecture Theatre A <i>Contributed talks</i>	Lecture Theatre C <i>Minisymposium: Optimisation and decomposition for image processing and related topics</i>
14:50 – 15:15	<b>Pivoting for Matrix Factorizations on Manycore Architectures</b> <i>J. Hogg</i> (Science & Technology Facilities Council)	<b>iPiano: Inertial Proximal Algorithm for Non-convex Optimization</b> <i>P. Ochs, T. Brox</i> (University of Freiburg), <i>Y. Chen and T. Pock</i> (Graz University of Technology)
15:15 – 15:40	<b>A data parallel implementation of the dual revised simplex method for large-scale stochastic LP problems</b> <i>J. A. J. Hall and M. Lubin</i> (University of Edinburgh)	<b>Universal coordinate descent method</b> <i>O. Fercoq and P. Richtárik</i> (University of Edinburgh)
<b>15:40 – 15:55</b>	<b>Tea/Coffee break – Physics Bridge Room</b>	
	Lecture Theatre A <i>Contributed talks</i>	Lecture Theatre C <i>Minisymposium: Optimisation and decomposition for image processing and related topics</i>

15:55 – 16:20	<b>Parallel solution of BABD systems arising from optimal control problems</b> <i>B. C Fabien</i> (University of Washington)	<b>A Domain Decomposition Method for Camera Placement</b> <i>M.L. Haenel</i> and <i>C. Schoenlieb</i> (University of Bayreuth)
16:20 – 16:45	<b>Alternating minimal energy methods for linear systems in higher dimensions</b> <i>D. Savostyanov</i> (University of Southampton)	<b>Non-Overlapping Domain Decomposition Methods For Dual Total Variation Based Image Denoising</b> <i>A. Langer</i> (University of Graz)
16:45 – 17:10	<b>On the influence of eigenvalues on Bi-CG residual norms.</b> <i>J. Duintjer Tebbens</i> and <i>G. Meurant</i> (Academy of Science of the Czech Republic, Prague)	<b>Discontinuity based total variation minimization for large scale X-ray tomography</b> <i>K. Hamalainen, L. Harhanen, A. Hauptmann, A. Kallonen, E. Niemi</i> and <i>S. Siltanen</i> (University of Helsinki)
<b>17:10 – 17:30</b>	<b><i>Tea/Coffee break – Physics Bridge Room</i></b>	
	<b>Lecture Theatre A</b>  <b><i>Contributed talks</i></b>	<b>Lecture Theatre C</b> <b><i>Minisymposium: Optimisation and decomposition for image processing and related topics</i></b>
17:30 – 17:55	<b>Parameter Estimation with Uncertainty and Sensitivity Analysis for the SARS outbreak in Hong Kong</b> <i>A. Naheed, M. Singh</i> and <i>D. Lucy</i> (Swinburne University of Technology, Hawthorn, Australia)	<b>Proximal coordinate descent with non-separable regularisers</b> <i>T. Valkonen</i> (Escuela Politecnica Nacional de Quito / University of Cambridge) <i>P. Richárik</i> and <i>O. Fercoq</i> (University of Edinburgh)

Friday 5 September

09:00 – 09:50	<b>Plenary Talk: Conditioning of Optimal State Estimation Problems</b> Nancy Nichols (University of Reading) – Lecture Theatre A	
	Lecture Theatre A <b>Minisymposium: First-order methods and big data optimization</b>	Lecture Theatre C <b>Minisymposium: Preconditioning for PDEs and Optimization</b>
09:50 – 10:15	<b>Semi-Stochastic Gradient Descent Methods</b> J. Konečný and P. Richtárik (The University of Edinburgh)	<b>On the interplay between discretization and preconditioning of Krylov subspace methods</b> J. Málek and Z. Strakoš (Charles University in Prague)
10:15 – 10:40	<b>A Unified Primal-Dual Optimization Framework for Constrained Convex Optimization</b> Q. Tran-Dinh and V. Cevher (Laboratory for Information and Inference Systems)	<b>New insights into alternative factorizations of saddle Point matrices</b> T. Rees and J. Scott (Rutherford Appleton Laboratory)
<b>10:40 – 11:00</b>	<b>Tea/Coffee break – Physics Bridge Room</b>	
	Lecture Theatre A <b>Minisymposium: First-order methods and big data optimization</b>	Lecture Theatre C <b>Minisymposium: Preconditioning for PDEs and Optimization</b>
11:00 – 11:25	<b>Assessing the Performance of First-order Algorithms: a Convex Optimization Approach</b> F. Glineur, J. M. Hendrickx and A. B.M. Taylor (Université catholique de Louvain)	<b>Convergence Properties of MINRES and CG for Large-Scale Problems</b> R. Herzog (Technical University of Chemnitz) and E. W. Sachs (University of Trier)
11:25 – 11:50	<b>Smooth minimization of nonsmooth functions with parallel coordinate descent</b> O. Fercoq and P. Richtárik (The University of Edinburgh)	<b>Condition Estimators in Euclidean norm</b> J. Duintjer Tebbens and M. Tuma (Czech Academy of Sciences)
11:50 – 12:15	<b>Accelerated parallel coordinate descent method with importance sampling</b> Z. Qu and P. Richtárik (The University of Edinburgh)	<b>Block Interface Preconditioners for Optimal Control of Elliptic PDE</b> D. Loghin (University of Birmingham)
12:15 – 12:40	<b>Distributed Training of Support Vector Machines</b> M. Jaggi (ETH Zurich)	<b>A parallelizable preconditioner for all-at-once solution of time-dependant PDE-constrained optimization problems</b> E. McDonald (Oxford University)
<b>12:40 – 14:00</b>	<b>Lunch - Physics Bridge Room</b>	
	Lecture Theatre A <b>Minisymposium: First-order methods and big data optimization</b>	Lecture Theatre C <b>Minisymposium: Preconditioning for PDEs and Optimization</b>
14:00 – 14:25	<b>Recent advances in Frank-Wolfe optimization</b> S. Lacoste-Julien (INRIA – SIERRA)	<b>Preconditioning saddle point formulation of the variational data assimilation</b> S. Guroi, S. Gratton (CERFACS, France) and M. Fisher (ECMWF)
14:25 – 14:50		<b>Contributed talk:</b> <b>The approximate computation of the LCM of sets of many polynomials as an optimization problem</b> D. Christou and N. Karcanias (City University)
14:50 – 15:40	<b>Plenary Talk: Hybrid methods for solving sparse linear systems</b> - Lecture Theatre A Iain Duff (Rutherford Appleton Laboratory and CERFACS Toulouse) - SIAM UKIE Speaker time change	
<b>15:40</b>	<b>Close</b>	

Conference supported by the Numerical Algorithms Group



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