

## Preface

### *Special issue on “Modern Optimization and Applications”*

This special issue contains eight selected papers from the International Workshop on Modern Optimization and Applications, which was held over three days, 27-29 June 2016 at Academy of Mathematics and Systems Science, Chinese Academy of Sciences, Beijing. This conference brought together leading scientists, researchers, and practitioners from world to exchange and shared ideas and approaches in using modern optimization techniques to model and solve real-world application problems from engineering, industry, and management. A prominent feature of this conference is the mixture of optimization theory, optimization methods, and practice of mathematical optimization. This conference provided a forum for researchers from academy to present their latest theoretical results while practitioners from industry to describe their real-world applications and discuss with researchers the best way to construct suitable optimization models and how to find algorithms capable of solving these models.

There are in total 19 invited speakers including Professor Sergiy Butenko (Texas A & M University, US; Editor-in-chief of Journal of Global Optimization), Professor Xiaojun Chen (Hong Kong Polytechnic University, HK), Professor Tim Conrad (ZIB/Freie Universitat Berlin, Germany), Professor Deren Han (Nanjing Normal University, China), Professor Thorsten Koch (ZIB/TU Berlin, Germany), Professor Zhi-Quan Luo (University of Minnesota, US), Professor Shiqian Ma (Chinese University of Hong Kong, HK), Professor Giacomo Nannicini (Singapore University of Technology and Design, Singapore), Professor Jiming Peng (University of Houston, US), Professor Ted Ralphs (Lehigh University, US), Professor Peter Richtarik (Edinburgh University, Scotland), Professor Anthony Man-Cho So (Chinese University of Hong Kong, HK), Professor Lin Xiao (Microsoft Research, Seattle, US), Professor Naihua Xiu (Beijing Jiaotong University, China), Professor Zongben Xu (Xi'an Jiaotong University, China), Professor Yinyu Ye (Stanford University, US), Professor Ya-xiang Yuan (Academy of Mathematics and Systems Science, Chinese Academy of Sciences, China), Professor Tong Zhang (Rutgers University, US), and Professor Yin Zhang (Rice University, US). In addition to 19 invited talks, there are also two poster sessions during the workshop and several Short Courses on Modern Optimization and Applications before and after the workshop. More than 150 participants attended the workshop. More information on the conference can be found at the conference website: <http://lsec.cc.ac.cn/~moa2016>.

This special issue contains eight papers from invited speakers devoted to a diverse range of topics on modern optimization and applications.

Hong Wang, Xin Liu, Xiaojun Chen and Ya-xiang Yuan show that the second-order necessary optimality implies global optimality for a class of nonconvex minimization problems arising from matrix factorization. Caixia Kou, Zhongwen Chen, Yu-Hong Dai and Haifei Han propose an augmented Lagrangian trust region method with a bi-object strategy for solving nonlinear equality constrained optimization. Fan Jiang, Deren Han and Xiaofei Zhang use the trust region technique to develop an alternating least-squares algorithm for tensor decompositions. Daniel Rehfeldt and Thorsten Koch introduced transformations for both the prize-collecting Steiner tree Problem and the maximum-weight connected subgraph problem to the Steiner arbores-

cence proble. Lei Yang, Junhui Wang and Shiqian Ma propose reduced-rank model with group sparsity regularization for high-dimensional model-based clustering. Mojmír Mutný and Peter Richtárik propose a parallel stochastic Newton method for minimizing unconstrained smooth convex functions. Ying Cui and Defeng Sun provide a complete characterization of the robust isolated calmness of the Karush-Kuhn-Tucker solution mapping for convex constrained optimization problems regularized by the nuclear norm function. Taoran Fu, Dongdong Ge and Yinyu Ye prove that the doubly-positive semidefinite programming is equivalent to the basic one with a set of valid quadratic cuts.

In addition to this special issue, we would like to mention that as the posters are of good quality, there is another special issue of *Journal of Global Optimization* (Editors: Thorsten Koch, Ya-feng Liu and Jiming Peng) for general participants. Specifically, two winners of MOA 2016 Best Poster Award are Bo Jiang from Nanjing Normal University for the paper “ $\ell_p$ -norm regularization algorithms for optimization over permutation matrices” and Shu Wang from Beihang University for the paper “ $\ell_p$ -ball constrained weighted maximin dispersion problem: convex relaxation misleads the approximation algorithm”.

We would like to thank all the referees very much for their contributions.

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Yu-Hong Dai	The Chinese Academy of Sciences
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