

## Preface

This special issue of “Journal of Industrial and Management Optimization” is dedicated to the memory of Professor Alexander Rubinov.

Professor Alexander Rubinov lost his battle with cancer on 9 September 2006. Active right up to his passing, he had been honoured only four days earlier with the appointment as the Inaugural EUROPT Fellow by the Continuous Optimization Working Group of the Association of European Operational Research Societies. His enormous contribution to nonlinear analysis and optimization and their applications has undoubtedly raised Australia’s profile in this field. He organized a number of conferences in Melbourne and Ballarat and was active in advancing the Pacific Optimization Research Activity Group. His interests were broad ranging, and he moved comfortably back and forth between abstract generalizations of classical convexity, practical algorithms for computationally complex problems in data analysis and telecommunications and various topics in between. He won many sizeable research grants as well as providing services to clients in industry. Despite his achievements, he was a humble and courteous man, always generous with his time and ideas. He was an exemplary supervisor, having about 45 graduate students altogether in his long career. He will be sorely missed by his friends and colleagues in Ballarat and the Optimization community worldwide.

This issue contains several contributions provided by the participants of the 5-th Ballarat Workshop on Nonsmooth and Global Optimization: Theory, Methods and Applications held at the University of Ballarat, November 28-30, 2006. The articles cover a wide range of problems in mathematical programming and its applications. These articles can be divided into three groups.

The first group contains articles considering different theoretical issues. The equivalence between the optimization reformulation with the gap function and the original quasi-variational inequality problems is shown in the paper “A class of gap functions for quasi-variational inequality problems” by M. Fukushima. The paper “Existence of closed graph, maximal, cyclic pseudo-monotone relations and revealed preference theory” by A. Eberhard and J-P. Crouzeix studies some properties of pseudo-convex functions. The paper “Solutions and optimality to box constrained nonconvex minimization problem” by D.Y. Gao presents a canonical duality theory for solving nonconvex programming problem subjected to box constraints.

The second group contains articles on algorithms for solving different optimization problems. In the paper “An update rule and a convergence result for a penalty function method” by R.S. Burachik and Y. Kaya a new update rule for a penalty function method is designed which is applicable to general optimization problems, including nonsmooth and nonconvex ones. The paper “Construction of aggregation operators for automated decision making via optimal interpolation and global optimization” by G. Beliakov examines methods of pointwise construction of aggregation operators via optimal interpolation. The use of a generalized version of

the modified subgradient algorithm for solving quadratic assignment problems is examined in the paper: “Solving the quadratic assignment problem using F-MSG algorithm” by R.N. Gasimov and O. Ustun. In the paper “A smoothing scheme for optimization problems with max-min constraints” by X.X. Huang, X.Q. Yang and K.L. Teo a minimization problem with a max-min constraint is considered and the min-max-min problem was rewritten as an optimization problem with several min-constraints and then each min-constraint function was approximated by a smooth function. The paper “Survey of trust-region derivative free optimization methods” by B. Karasozen presents a survey of interpolation based derivative free optimization methods.

An exact algorithm for solving polynomial knapsack problems is proposed in the paper “An exact algorithm for 0-1 polynomial knapsack problems” by X. Sun, H. Sheng, D. Li. The paper “Linear programming solutions of periodic optimization problems: approximation of the optimal control” by L. Finlay, V. Gaitsgory, I. Lebedev establishes the convergence of controls constructed on the basis of the solution of the finite dimensional linear programming problems to the optimal control of a periodic optimization problem.

The third group of articles cover different applications of optimization techniques. The paper “A model for adaptive rescheduling of flights in emergencies (MARFE)” by J.A. Filar, P. Manyem, D.M. Panton and K. White develops techniques facilitating rapid return of airline schedules to normal operations. Gene-environment networks with intervals are the subject of the paper “Optimization and dynamics of gene-environment networks with intervals” by Ö. Uğur and G.W. Weber. In the paper “Matching the grade correlation coefficient using a copula with maximum disorder” by J. Piantadosi, P. Howlett and J. Boland a doubly stochastic matrix is used to define a copula that preserves the given marginal distributions and matches a known grade correlation coefficient in such a way that the entropy of the doubly stochastic matrix is maximized. Papers “Management of water storage in two connected dams” by P. Howlett, J. Piantadosi, P. Thomas and “On an optimal control policy for stormwater management in two connected dams” by C.E.M. Pearce, J. Piantadosi, P.G. Howlett study different aspects of water storage management. The paper “Integrated production system optimization using global optimization techniques” by T.L. Mason, A. Bagirov, C. Emelle, F. Kampas, J. Pinter, and J. van Berkel applies global optimization techniques to solve optimization problems related to integrated oil and gas production systems.

We wish to express our gratitude to all authors for their contributions and making possible this special issue. We thank all referees for their careful and speedy reviews.

We are also greatly indebted to Professor Kok Lay Teo for having accepted to host this collection in the “Journal of Industrial and Management Optimization”.

Adil Bagirov

*a.bagirov@ballarat.edu.au*

Centre for Informatics and Applied Optimization  
University of Ballarat, Victoria, Australia