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# Editorial: making an impact with optimization

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## EDITORIAL

### **Making an Impact with Optimization**

The 27<sup>th</sup> *European Conference on Operational Research, EURO XXVII*, took place between July 12-15 2015 at the University of Strathclyde in Glasgow, UK. In addition to three inspiring plenary sessions delivered by Tyrrell Rockafellar, Alan Wilson and Grazia Speranza, the conference also held eight keynote and three tutorial sessions by highly distinguished scholars. With over 2,300 accepted abstract in over 100 streams, the conference provided an excellent environment for exposure to new ideas and collaboration opportunities.

Organized in conjunction with The OR Society, the oldest OR society in the world with over 2,700 members from more than 65 countries, the theme of EURO XXVII was 'Making an Impact'. It was the very first EURO conference to incorporate a dedicated 'Making an Impact' stream, whose aim is to bring together academics and practitioners to encourage an exchange of ideas and stimulate collaboration. Being already a well-established feature of the national OR conferences in the UK, it now been introduced to the EURO level as well.

On the occasion of this highly successful event, and in order to pay tribute to its theme, the journal *Optimization* kindly offered us to edit a special issue that enabled us to bridge the 'Making an Impact' theme with the fascinating area of optimization. The first call of papers in 2015 invited high quality original research papers with a focus on developing new optimization models, modelling features and/or solution techniques that were driven by the need of a particular application, as well as showing the impact these models and algorithms had for the application, with techniques drawn from all areas of optimization, including linear programming, semidefinite and conic programming, semi-infinite programming, stochastic programming, global optimization, nonlinear and non-smooth optimization, multi-objective optimization, robust optimization, integer and mixed-integer programming, mixed-integer non-linear programming, game theory, dynamic optimization and stochastic control.

A rigorous review and selection process was implemented for the numerous submissions to our special issue. All papers have gone through multiple rounds of revisions to ensure the expected high quality. During the selection process, we ensured in particular that each selected paper makes a strong theoretical contribution, related to the aims and scope of the journal *Optimization*, and is in line with the expectations of the special issue. Finally, only five papers reached the final successful outcome, and we gladly discuss these contributions next.

In the paper '*A co-opetitive framework for the hub location problems in transportation networks*', R.N. Monemi, S. Gelareh, S. Hanafi and N. Maculan present the first model of co-opetition for a Hub Location Problem between two logistics service provider companies where the mother company owns the infrastructure. Competition takes place between both operators to enhance their share generated from the additional market. In the authors' matheuristic algorithm, neighbourhood solutions are evaluated by a Lagrangean relaxation. Numerical examples apply the proposed method on a real case study.

The paper '*Various motivations for managerial (mis)reporting – an experimental study*' by A. Rasmussen and U. Leopold-Wildburger is interested in reporting-behaviour patterns resulting from different motivations for potential misrepresentation. The authors model the consequences from misreporting for both a shareholder and a manager. This allows for examining the stability of (mis-) reporting behaviour in different treatments. Agents are primarily driven by the consequences for themselves. Eventually, the experiment indicates that pro-social agents report more truthfully than pro-self agents.

In the paper '*Optimization of transmission network for homogeneous good market*' by A. Vasin, H. Gao, M. Dolmatova and G.-W. Weber, a homogeneous good market represented as a network is studied theoretically. This type of competitive network structure is highly relevant to energy markets, in particular electricity and oil, where local markets are connected to each other via capacitated transmission lines. The paper establishes various important theoretical properties of a welfare optimization model, in particular how the optimal solutions could be structured in special and generalized cases of the problem.

The paper '*Robust optimization in spline regression models for multi-model regulatory networks under polyhedral uncertainty*' by A. Özmen, E. Kropat and G.-W. Weber investigates the challenging problems stemming from inherent uncertainties in data-based prediction of regulatory networks. Applying a robust optimization approach on the underlying regression models and specifically analysing the polyhedral uncertainties, the proposed framework achieves successful results, in particular reducing the variance with respect to benchmarked methods such as MARS.

The paper '*Optimization of Generalized Desirability Functions under Model Uncertainty*' by B. Akteke-Öztürk, G.-W. Weber and G. Köksal shows how semi-infinite programming and disjunctive optimization can be used to robustify the desirability function optimization problem against the uncertainty in the underlying multi-response models. Desirability functions are a popular approach in industry to find optimal design parameters for a product or process, where the responses of interest are usually estimated by a regression model based on experimental data. The advantages of the new approach in obtaining more robust solutions are nicely demonstrated on a chemical process design problem from the literature.

## **Acknowledgement**

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