

Preface

Yves Crama, Michel Grabisch & Silvano Martello

Annals of Operations Research

ISSN 0254-5330

Volume 271

Number 1

Ann Oper Res (2018) 271:1-2

DOI 10.1007/s10479-018-3035-4



Your article is protected by copyright and all rights are held exclusively by Springer Science+Business Media, LLC, part of Springer Nature. This e-offprint is for personal use only and shall not be self-archived in electronic repositories. If you wish to self-archive your article, please use the accepted manuscript version for posting on your own website. You may further deposit the accepted manuscript version in any repository, provided it is only made publicly available 12 months after official publication or later and provided acknowledgement is given to the original source of publication and a link is inserted to the published article on Springer's website. The link must be accompanied by the following text: "The final publication is available at link.springer.com".



Preface

Yves Crama¹ · Michel Grabisch² · Silvano Martello³

Published online: 1 September 2018

© Springer Science+Business Media, LLC, part of Springer Nature 2018

The journal *4OR: A Quarterly Journal of Operations Research* publishes in almost every issue a state-of-the-art survey authored by a well-established scholar on invitation by the editors. There is a long standing triennial collaboration between the journal and the *Annals of Operations Research*. The editors of *4OR* collect the surveys that appeared in the last three volumes and, invited by the editor of the *Annals*, serve as guest editors to an issue that collects them. As the first four issues of this series were very successful, it was decided to continue it. The present issue collects seven surveys that appeared in the triennium 2015–2017 of *4OR*. The authors were given the opportunity to correct, revise, update and sometimes substantially improve their past work.

An introduction to the surveys follows. For each one, we indicate in which *4OR* volume/issue it originally appeared. The papers have been kept in their original order of publication, this being the only rational and fair order for such a wide range of subjects.

1. *Large-scale unit commitment under uncertainty: an updated literature survey* [*4OR* 13/2, Tahanan et al. (2015)]: Milad Tahanan, Wim van Ackooij, Antonio Frangioni, and Fabrizio Lacalandra provide a survey of the literature on methods for the uncertain Unit Commitment problem, in all its variants. They start with a review of the main solution methods for the deterministic versions of the problem, and then present and categorize the approaches to the uncertain version.
2. *When polynomial approximation meets exact computation* [*4OR* 13/3, Paschos (2015)]: Vangelis Paschos outlines a relatively new research agenda aiming at building a new approximation paradigm by matching two distinct domains: the polynomial approximation and the exact solution of \mathcal{NP} -hard problems by algorithms with guaranteed and non-trivial upper complexity bounds.

✉ Silvano Martello
dipdeis.4or@unibo.it

Yves Crama
Yves.Crama@uliege.be

Michel Grabisch
michel.grabisch@univ-paris1.fr

¹ HEC Management School, University of Liège, Rue Louvrex 14, 4000 Liège, Belgium

² Paris School of Economics, Université Paris I, 106-112 Boulevard de l'Hôpital, 75013 Paris, France

³ DEI "Guglielmo Marconi", Alma Mater Studiorum Università di Bologna, Viale Risorgimento 2, 40136 Bologna, Italy

3. *Shared mobility systems: An updated survey* [4OR 13/4, Laporte et al. (2015)]: Gilbert Laporte, Frédéric Meunier, and Roberto Wolfler Calvo consider several problems arising in the optimization of shared mobility systems for bicycles and cars. They classify the relevant literature under five main headings: station location, fleet dimensioning, station inventory, re-balancing incentives, and vehicle repositioning.
4. *Vehicle routing problems with multiple trips* [4OR 14/3, Cattaruzza et al. (2016)]: Diego Cattaruzza, Nabil Absi and Dominique Feillet consider the multi-trip vehicle routing problem and related areas. They provide a unified view of mathematical formulations and a survey of exact and heuristic approaches. Variants of the problem and other families of routing problems where multiple trips are sometimes allowed are also considered.
5. *Recent results on assigned and unassigned distance geometry with applications to protein molecules and nanostructures* [4OR 14/4, Billinge et al. (2016)]: Simon Billinge, Phillip Duxbury, Douglas Gonçalves, Carlile Lavor, and Antonio Mucherino introduce the body of knowledge called distance geometry, that has been originated by seminal results of Menger and Blumenthal. They review some recent developments for assigned and unassigned distance geometry and focus on two main applications: determination of three-dimensional conformations of biological molecules and nanostructures.
6. *Optimization in liner shipping* [4OR 15/1, Brouer et al. (2017)]: Berit Dangaard Brouer, Christian Vad Karsten, and David Pisinger give an overview of data-driven optimization problems in liner shipping. Starting from the liner shipping network design, they present the problem of container routing and speed optimization. They also consider empty container repositioning, stowage planning, disruption management, and bunker purchasing. Future challenges and directions for further research are discussed.
7. *Recent contributions to linear semi-infinite optimization—An update* [4OR 15/3, Goberna and López (2017)]: Miguel Angel Goberna and Marco Antonio López review the state-of-the-art in the theory of deterministic and uncertain linear semi-infinite optimization, presenting some numerical approaches and describing a selection of recent applications in a variety of fields. Extensions to related optimization areas, such as convex semi-infinite optimization, linear infinite optimization, and multi-objective linear semi-infinite optimization, are also commented.

In the first article of the present issue the reader will find an introductory description of the surveys that were published in the previous issues of the series: we believe that the 52 surveys published so far offer an in-depth coverage of many hot fields in Operations Research.

References

- Billinge, S. J. L., Duxbury, P. M., Gonçalves, D. S., Lavor, C., & Mucherino, A. (2016). Assigned and unassigned distance geometry: Applications to biological molecules and nanostructures. *4OR*, *14*(4), 337–376.
- Brouer, B. D., Karsten, Ch V, & Pisinger, D. (2017). Optimization in liner shipping. *4OR*, *15*(1), 1–35.
- Cattaruzza, D., Absi, N., & Feillet, D. (2016). Vehicle routing problems with multiple trips. *4OR*, *14*(3), 223–259.
- Goberna, M. A., & López, M. A. (2017). Recent contributions to linear semi-infinite optimization. *4OR*, *15*(3), 221–264.
- Laporte, G., Meunier, F., & Wolfler Calvo, R. (2015). Shared mobility systems. *4OR*, *13*(4), 341–360.
- Paschos, V Th. (2015). When polynomial approximation meets exact computation. *4OR*, *13*(3), 227–245.
- Tahanan, M., van Ackooij, W., Frangioni, A., & Lacalandra, F. (2015). Large-scale unit commitment under uncertainty. *4OR*, *13*(2), 115–171.