

Studies in Systems, Decision and Control

Volume 276

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Decision Making under Constraints



Springer

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Preface

In many application areas, it is necessary to make effective decisions under constraints. Several area-specific techniques are known for such decision problems; however, because these techniques are area-specific, it is not easy to apply each technique to other applications areas.

Cross-fertilization between different application areas is one of the main objectives of the annual International Workshops on Constraint Programming and Decision Making. Papers from the previous workshops appeared in [9] and in [10].

The 2016–2018 CoProd workshops, held in Europe (Upsala, Sweden), in America (El Paso, Texas), and in Asia (Tokyo, Japan), have also attracted researchers and practitioners from all over the world.

This volume presents extended versions of selected papers from these workshops—as well as several papers from the 2019 workshop which was co-located with the 2019 World Congress of the International Fuzzy Systems Association IFSA'2019 (Lafayette, Louisiana, USA).

These papers deal with all stages of decision making under constraints:

- formulating the problem of (in general, multi-criteria) decision making in precise terms [5, 6, 14, 27];
- determining when the corresponding decision problem is algorithmically solvable [8, 14, 16, 20];
- finding the corresponding algorithms, and making these algorithms as efficient as possible [2, 3, 5, 6, 7, 13, 15, 18, 20, 21, 24]; and
- taking into account interval uncertainty [8, 15, 16, 17, 18, 22, 23, 26], probabilistic uncertainty [1, 12, 15], and fuzzy uncertainty [1, 4, 11, 12, 15, 25] inherent in the corresponding decision making problems.

Several papers describe applications, in particular, applications:

- to biology [19],
- to engineering: to control of a smart thermostat [25], to control of Unmanned Aerial Vehicles [18], to power engineering [26], to structural mechanics [22], to vehicle protection against Improvised Explosion Devices [28], to waste water engineering [27],
- to finance [15],
- to software engineering [29].

We are greatly thankful to all the authors and referees, and to all the participants of the CoProd workshops. Our special thanks to Prof. Janusz Kacprzyk, the editor of this book series, for his support and help. Thanks to all of you!

El Paso, USA
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