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**315**

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# Group Decision and Negotiation in an Uncertain World


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## Preface

The annual conferences on Group Decision and Negotiation have become an important meeting point for researchers interested in the many aspects of collective decision-making. What started out as a one-time event at the beginning of the millennium has developed into a series of conferences that have been held (with one exception) every year since 2000. GDN is a truly global conference uniting researchers from all over the world, which to date has been held in four continents: Once each in Australia (Perth 2002) and South America (Recife 2012), four times in North America (Banff 2004, Mt. Tremblant 2007 and Toronto 2009, all in Canada, and Bellingham, USA 2016), and 11 times in Europe (Glasgow 2000, La Rochelle 2001, Istanbul 2003, Vienna 2005, Karlsruhe 2006, Coimbra 2008, Delft 2010, Stockholm 2013, Toulouse 2014, Warsaw 2015, and Stuttgart 2017).

GDN in 2018 came to Asia for the first time, and we are very grateful to the Nanjing University of Aeronautics and Astronautics for hosting this conference. In total, 143 papers grouped into 23 different streams were submitted for the conference, covering a wide range of topics related to group decisions and negotiations. Particularly large streams were, for example, conflict resolution (23 papers), preference modeling in GDN (13 papers), complex systems and decision analysis (13 papers), and consensus processes in decision-making (11 papers).

Out of these 143 papers, 15 papers were selected for inclusion in this volume based on a thorough review process. We have grouped these papers into three main areas: theoretical concepts of GDN, decision support and behavior in GDN, and applications of GDN.

The section on theoretical concepts of GDN contains three papers that present formal models intended to support groups of decision makers in various tasks. Xiaomei Mi and Huchang Liao in their paper “Hesitant Fuzzy Linguistic Group Decision-Making with Borda Rule” combine an innovative approach from soft computing, hesitant fuzzy sets, with one of the oldest methods of social choice, the Borda rule, to obtain a flexible and powerful tool of group decision-making. An important aspect in this kind of decision is data uncertainty, which is at the focus of the paper “A Multistage Risk Decision-Making Method for Normal Cloud Model Considering Three Reference Points” by Wen Song and Jianjun Zhu. Finally, Zhexuan Zhou, Xiangqian Xu, Yajie Dou, Yuejin Tan, and Jiang Jiang address this issue in the specific context of the selection of multiple decision alternatives in a portfolio setting in their paper “System Portfolio Selection Under Hesitant Fuzzy Information.”

The papers in the second section deal with empirical studies of various methods to support groups and negotiators in their decision-making processes, and the behavioral effects that such support might have. In their paper “Representative Decision-Making and the Propensity to Use Round and Sharp Numbers in Preference Specification,” Gregory E. Kersten, Ewa Roszkowska, and Tomasz Wachowicz look at an interesting bias phenomenon that might occur when supporting negotiations. Negotiation support

models need a description of the negotiator's preferences; however, the elicitation process for these preferences could be distorted because users tend to provide "easy" numbers rather than exact information. The paper by Lucia Reis Peixoto Roselli, Eduarda Asfora Frej, and Adiel Teixeira de Almeida on "Neuroscience Experiment for Graphical Visualization in the FITradeoff Decision Support System" represents a new development in behavioral research on decision-making: Rather than just observing decisions and behavior, researchers begin more and more to measure the physiological processes during decision-making. As the authors show in their paper, physical data can indeed be used to, for example, better measure the cognitive effort in the decision process. Often, negotiators bargain on behalf of some institution or a principal, and then it is important that they are able to understand and follow the preferences of the group they are representing. The paper "On the Impact of the Negotiators' Culture, Background, and Instructions on the Representative Negotiation Process and Outcomes" by Tomasz Wachowicz, Gregory E. Kersten, and Ewa Roszkowska studies whether negotiators' ability to follow such instructions is dependent on their culture. The last two papers in this section study behavioral effects and preferences of negotiators in different application settings. Marta Dell'ovo, Eduarda Frej, Alessandra Oppio, Stefano Capolongo, Danielle Morais, and Adiel de Almeida describe the complex elicitation of preferences in a real life application in their paper "FITradeoff Method for the Location of Health-Care Facilities Based on Multiple Stakeholders' Preferences." Parmjit Kaur and Ashley Carreras in their paper "Capturing the Participants' Voice: Using Causal Mapping Supported by Group Decision Software to Enhance Procedural Justice" focus on an earlier phase of the decision process, the conceptual modeling of the decision problem, and study whether usual approaches to this modeling are fair in the sense that viewpoints of all participants are adequately taken into account. In the final paper of this section, Rustam Vahidov deals with an interesting way of influencing negotiator behavior. The paper shows that providing different images for an artificial opponent in human-computer negotiations will lead to different behavior on the side of the human negotiator.

The last section combines papers on specific application areas of group decisions and negotiations. The first two papers in this section are related to China's new silk road initiative. Shawei He, Ekaterina Flegentova, and Bing Zhu in their paper "Analyzing Conflicts of Implementing High-speed Railway Project in Central Asia Using Graph Model" study potential conflicts that might arise in creating the necessary traffic infrastructure, and how GDN tools like the graph model of conflict resolution might help to overcome them. A similar question is addressed in the paper "Strategic Negotiation for Resolving Infrastructure Development Disputes in One Belt One Road Initiative" by Waqas Ahmed, Qingmei Tan, and Sharafat Ali. The graph model is also applied to another global conflict in the paper "Attitudinal Analysis of Russia-Turkey Conflict with Chinese Role as a Third-Party Intervention" by Sharafat Ali and Haiyan Xu. The paper "Behavioral Modeling of Attackers Based on Prospect Theory and Corresponding Defenders Strategy" by Ziyi Chen, Chunqi Wan, Bingfeng Ge, Yajie Dou, and Yuejin Tan combines game theoretic analysis and the behavioral concepts of prospect theory to provide a more realistic model of a conflict situation. Last, but not least, the paper "A Multi-Stakeholder Approach for Energy Transition Policy Formation in Jordan" by Mats Danielson, Love Ekenberg, and Nadejda

Komendantova deals with conflicts and group decisions in the energy transition that many countries have to undergo.

The preparation of the conference and of this volume required the efforts and collaboration of many people. In particular, we thank the general chair of GDN 2018, Gregory Kersten, for his continuous support and effort that helped us to select the right papers for this volume and to carry out the review process within a short time. Special thanks also go to all the reviewers for their timely and informative reviews: Irene Abi-Zeid, Meng Chen, Shuding Chen, Ana Paula Costa, Suzana Daher, Xiao Deng, Luis Dias, Qingxing Dong, Love Ekenberg, Mohammad Feylizadeh, Michael Filzmoser, Amanda Garcia, Dorota Górecka, Masahide Horita, Zihan Jiang, Ginger Ke, Mark Kersten, Sabine Koeszegi, Tobias Langenegger, Jichao Li, Kevin Li, Xiaoning Lu, Philipp Melzer, Rafał Mierzwia, Danielle Morais, Iván Palomares, Leandro C. Rego, Ewa Roszkowska, Yinxiaohe Sun, Liangyan Tao, Adiel Teixeira de Almeida, Ofir Turel, Tomasz Wachowicz, Junjie Wang, Liangpeng Wu, Yi Xiao, Fang Yin Hai, Bo Yu, Pascale Zaraté, Hengjie Zhang, Shinan Zhao, and Jinhua Zhou.

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May 2018

Ye Chen  
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# Contents

## **Theoretical Concepts of Group Decision and Negotiation**

Hesitant Fuzzy Linguistic Group Decision Making with Borda Rule . . . . .	3
<i>Xiaomei Mi and Huchang Liao</i>	
A Multistage Risk Decision Making Method for Normal Cloud Model with Three Reference Points . . . . .	14
<i>Wen Song and Jianjun Zhu</i>	
System Portfolio Selection Under Hesitant Fuzzy Information. . . . .	33
<i>Zhexuan Zhou, Xiangqian Xu, Yajie Dou, Yuejin Tan, and Jiang Jiang</i>	

## **Decision Support and Behavior in Group Decision and Negotiation**

Representative Decision-Making and the Propensity to Use Round and Sharp Numbers in Preference Specification . . . . .	43
<i>Gregory E. Kersten, Ewa Roszkowska, and Tomasz Wachowicz</i>	
Neuroscience Experiment for Graphical Visualization in the FITradeoff Decision Support System . . . . .	56
<i>Lucia Reis Peixoto Roselli, Eduarda Asfora Frej, and Adiel Teixeira de Almeida</i>	
Impact of Negotiators' Predispositions on Their Efforts and Outcomes in Bilateral Online Negotiations . . . . .	70
<i>Bo Yu and Gregory E. Kersten</i>	
Some Methodological Considerations for the Organization and Analysis of Inter- and Intra-cultural Negotiation Experiments. . . . .	82
<i>Tomasz Wachowicz, Gregory E. Kersten, and Ewa Roszkowska</i>	
FITradeoff Method for the Location of Healthcare Facilities Based on Multiple Stakeholders' Preferences . . . . .	97
<i>Marta Dell'Ovo, Eduarda Asfora Frej, Alessandra Oppio, Stefano Capolongo, Danielle Costa Morais, and Adiel Teixeira de Almeida</i>	
Capturing the Participants' Voice: Using Causal Mapping Supported by Group Decision Software to Enhance Procedural Justice . . . . .	113
<i>Parmjit Kaur and Ashley L. Carreras</i>	

The Effects of Photographic Images on Agent to Human Negotiations:  
The Case of the Sicilian Clan . . . . . 127  
*Rustam Vahidov*

**Applications of Group Decision and Negotiations**

Analyzing Conflicts of Implementing High-Speed Railway Project  
in Central Asia Using Graph Model . . . . . 139  
*Shawei He, Ekaterina Flegentova, and Bing Zhu*

Strategic Negotiation for Resolving Infrastructure Development Disputes  
in the Belt and Road Initiative . . . . . 154  
*Waqas Ahmed, Qingmei Tan, and Sharafat Ali*

Attitudinal Analysis of Russia-Turkey Conflict with Chinese Role  
as a Third-Party Intervention . . . . . 167  
*Sharafat Ali, Haiyan Xu, Peng Xu, and Michelle Theodora*

Behavioral Modeling of Attackers Based on Prospect Theory  
and Corresponding Defenders Strategy. . . . . 179  
*Ziyi Chen, Chunqi Wan, Bingfeng Ge, Yajie Dou, and Yuejin Tan*

A Multi-stakeholder Approach to Energy Transition Policy Formation in  
Jordan . . . . . 190  
*Mats Danielson, Love Ekenberg, and Nadejda Komendantova*

Correction to: A Multi-stakeholder Approach to Energy Transition Policy  
Formation in Jordan . . . . . E1  
*Mats Danielson, Love Ekenberg, and Nadejda Komendantova*

**Author Index . . . . . 203**