Editorial on Conflict Resolution and Group Decision Based on Papers from the 2018 International Conference on Group Decision and Negotiation (GDN 2018)

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The key objective of this special issue of the Journal of Systems Science and Systems Engineering (JSSSE) is to assess papers containing leading-edge ideas on the theory and practice of conflict resolution and group decision making. Earlier versions of these fine papers were originally delivered by the authors at the 18th International Conference on Group Decision and Negotiation (GDN) which was held in Nanjing, China, from June 9 to 13, 2018 (GDN 2018), and which appeared as extended abstracts in a conference proceedings edited by Jiang et al. (2018) for which the authors of these abstracts maintain the copyrights. Subsequent to GDN 2018, authors were invited by the Guest Editors to prepare and submit significantly expanded versions of their papers for review and possible publication in this special issue of JSSSE. Following an overview of GDN 2018, the Guest Editors put the admirable contributions of the authors of these papers into perspective. In this way, readers will enjoy their academic journey through this landscape of fascinating concepts and challenging real-world applications as they learn about the many contributions of the authors in this important realm of conflict resolution and group decision.

The GDN Section comprises a dedicated

body of scholars and practitioners, which is part of a highly respected international organization called INFORMS (The Institute for Operations Research and the Management Sciences). In response to the need to have a unique dedicated professional organization that represents members interested in addressing a challenging array of issues occurring in group decision and negotiation, Melvin Shakun founded the GDN Section and an associated journal within INFORMS in 1992. Starting in the year 2000 in the Scottish city of Glasgow, the GDN Section launched an annual series of conferences which has subsequently convened in cities around the globe on a yearly basis except for a one year gap when the “Arab Spring” blossomed in the Middle East. GDN 2018 constitutes the first occasion on which the GDN Section convened a conference in China or anywhere within Asia. In fact, under the fine leadership of Prof. Haiyan Xu and in concert with international and Chinese colleagues, GDN 2018 marks the largest GDN conference ever held thus far and, like its predecessors, was highly successful. The attractive venue in which GDN 2018 was held from June 9 to 13, 2018 was the Marriott Nanjing South Hotel located in the beautiful historical city of Nanjing. The Nanjing University of Aeronautics and As-

tronautics (NUAA) was the generous sponsor of GDN 2018 with most of the local organizers being based in the College of Economics and Management (CEM) at NUAA.

The organizational team and Guest Editors are glad to report that more than 250 scholars participated in GDN 2018. Prior to the conference, over 140 submissions of extended abstracts and papers were received for review and possible presentation at GDN 2018. For release at the commencement of the conference on June 9, 2018, a local volume containing 108 abstracts organized into eight main topics was prepared (Jiang et al. 2018). Additionally, a Springer book entitled *Group Decision and Negotiation in an Uncertain World* having a total of 15 refereed full conference papers was released (Chen et al. 2018). As just mentioned, this special JSSSE issue of papers first presented at GDN 2018 was put together by the Guest Editors after the conference was held. There are seven papers from GDN 2018 appearing in this special issue, which can be subdivided into two main categories: three papers falling under the classification of conflict resolution and four articles dealing with important topics in group decision making.

Consider first the three papers falling under the theme of conflict resolution, all of which deal with the Graph Model for Conflict Resolution (GMCR). In the first paper, Wu et al. (2019) design a mediation strategy for employment by a third party to bring two disputants together to achieve a reasonable resolution. In particular, within the structure of the matrix interpretation of the GMCR, the authors use inverse GMCR to ascertain the minimum preference change required to reach a reasonable result. Their procedure is applied to a conflict between a patient and a medical service provider.

Silva et al. (2019) are motivated by a local development conflict in Recife, Brazil, to design a procedure for obtaining the preferences

of a DM, such as a regulatory body which is supposed to be unbiased. To achieve this, the authors design a procedure for integrating Dempster-Shafer Theory for combining expert knowledge and the Analytic Hierarchy Process (AHP) to rank the states for the regulator or DM being considered. They employ their methodology to obtain the preferences of a regulator involved in a construction project conflict labelled “The New Recife Project” and subsequently carry out a GMCR study to determine the possible compromise resolutions.

Langenegger and Hipel (2019) use GMCR for strategically investigating the negotiation that took place between the USA and Iran to arrive at an agreement over Iran’s nuclear program. In fact, Iran continually escalated the conflict by building more centrifuges needed to produce fissionable nuclear material while the USA responded by stiffening economic sanctions against Iran until both sides finally agreed to negotiate a settlement. The authors also study the role attitudes played in this widely known dispute.

The contributions contained in the four papers mainly dealing with group decision making are now put into perspective. Zhou et al. (2019) examine strategic cooperation from the viewpoint of a weak chain member based on a multi-stage game and bargaining game. They develop game models under different scenarios to investigate the optimal decisions of all stakeholders, and study how to realize strategic cooperation between the weak main manufacturer and the strong supplier. They further design a revenue-sharing contract based on a relationship-specific investment to cause the cooperation to be more effective. A numerical study is discussed based on the case of KLX Inc. and one major manufacturer of Chinese large passenger aircraft to illustrate the superiority of the proposed method.

Considering terrorists’ psychological factors in the decision-making process, Ge et

al. (2019) propose a defensive resource allocation model within the framework of cumulative prospect theory, in which interval values are utilized for representing the uncertainty of reference points and criteria values. Furthermore, a numerical example is utilized to demonstrate how the proposed model can be employed for effectively determining optimal solutions of the defender in counterterrorism resource allocation. In the future, the resource allocation model developed in this paper could be extended by taking into account preference uncertainty, dynamic resource distribution strategy, and other situations.

Zhan et al. (2019) propose a social network uncertain bounded confidence (SNUBC) model for investigating the uncertain opinion evolution having bounded confidence effects, in which opinions of agents involved in a social network could be certain or uncertain. To explore the impact of uncertain opinions and uncertain tolerances on the evolution results in a SNUBC model, theoretical analyses and numerical examples are presented from two aspects: the ratios of agents expressing uncertain opinions and the average widths of uncertain opinions. Afterwards, the authors study the impacts of social networks, uncertain opinions and bounded confidences on the uncertain opinion evolution in the SNUBC model, in which ER random graphs, WS small world networks, and BA scale free networks are utilized to simulate real social networks.

Finally, Wang and Gong (2019) present a chance constraint and uncertainty theory based optimal priority model for group intuitionistic fuzzy preference relations having a normal uncertainty distribution. The results indicate that, while belief degrees in the chance constraints vary, the priorities for alternatives derived from Model (11) and Model (13) always have an inverse relationship, and the priority of four government departments remain the same. Based on expert elicita-

tion, this method can be further applied to the multi-attribute issue evaluation being considered such as sustainability index construction.

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