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Witold Pedrycz
Shyi-Ming Chen *Editors*

Granular Computing and Decision-Making

Interactive and Iterative Approaches

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Contents

Using Computing with Words for Managing Non-cooperative Behaviors in Large Scale Group Decision Making

Francisco José Quesada, Iván Palomares, and Luis Martínez

Abstract. Normally, in group decision making problems, groups are composed by individuals or experts with different goals and points of view. For these reasons, they may adopt distinct behaviors in order to achieve their own aims. Nonetheless, in such problems in general, specially those demanding a certain degree of consensus, each expert should comply with a collaboration contract in order to find a common solution for the decision problem. When decision groups are small, all experts usually attempt to fulfill the collaboration contract. However, nowadays technologies such as social media allow to make consensus-driven decisions with larger groups, in which many experts are involved, hence the possibility that some of them try to break the collaboration contract might be greater. In order to prevent the group solution from being biased by these experts, it is necessary to detect and manage their non-cooperative behaviors in this kind of problems. Recent proposals in the literature suggest managing non-cooperative behavior by reducing the importance of expert opinions. These proposals present drawbacks such as, the inability of an expert to recover his/her importance if behavior improves; and the lack of expert's behavior measures across the time. This chapter introduces a methodology based on fuzzy sets and computing with words, with the aim of identifying and managing those experts whose behavior does not contribute to reach an agreement in consensus reaching processes. Such a methodology is characterized by allowing the importance recovery of experts and taking into account the evolution of their behavior across the time.

Keywords: Group Decision Making, Computing with Words, Fuzzy sets, Consensus Reaching Processes.

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Author Index