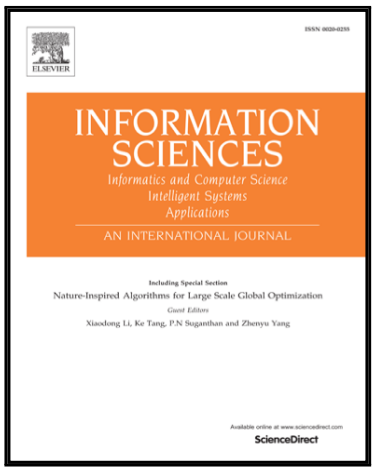

Three-way decision approaches to conflict analysis using decision-theoretic rough set theory

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Three-way decision approaches to conflict analysis using decision-theoretic rough set theory

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Abstract. Social progress normally occurs through a sequence of struggles and conflicts, and there has been relatively little progress in developing effective methods for conflict analysis. Decision-theoretic rough set theory is a powerful mathematical tool for depicting ambiguous information, and it can provide constructive advice for decision making. In this paper, we first present the concepts of probabilistic conflict, neutral, and allied sets of conflicts and then discuss the mechanism for computing the thresholds α and β for conflict analysis using decision-theoretic rough set theory. Then, we describe incremental algorithms for constructing the probabilistic conflict, neutral, and allied sets in dynamic information systems, and their effectiveness is illustrated by experimental results. In light of the relationship between maximal coalitions and allied sets, we finally provide efficient approaches to help a government adjust various policies according to changes in the present international situation to calculate the maximal coalitions in dynamic information systems.

Keywords: Conflict analysis; Decision-theoretic rough sets; Dynamic information systems; Three-way decision theory

1 Introduction

Conflict, as an important characteristic of human nature, exists in various real-world situations, and we are primarily interested in finding the essence of the conflict issue to reduce tensions and improve the relationship between the two sides of a conflict. Conflict analysis [9, 18, 23, 24, 31, 33, 35, 42], which aims to explore the nature of conflict, has recently attracted increasing attention. For example, Pawlak [23]

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