

Chapter 56

Rough–Set–Based Decision Model for Incomplete Information Systems

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ABSTRACT

Databases use the data and evaluate managerial decisions in the process of data mining, and it has become imperative that we give the name of the emergence of the field. The rough set is a concept derived from the fuzzy logic approach to carry out the analysis of structures with uncertain data mining techniques. The decision will be developed in conjunction with computerized decision support model, giving more efficient automation systems with cuckoo search algorithm that are targeted. The suggested decision support system covers the inputs, user knowledge and expertise, outputs, and decision components. In addition, data access, interactive mode, adaptability, and flexible mode provides solutions and decision-making process for certain and uncertain data with suggested rough-set-based algorithm structure.

INTRODUCTION

The increasing use of computers and information are getting necessity with increased expertise and digital data storage, that becomes compulsory and importance for usage. Rapidly increasing data traffic has revealed a major case for efficient manner with the use of the big data. Developed algorithm and suggested model can help using of the data in database structure and evaluate and process of the data for taking managerial decisions with rough sets approach. Rough sets derived from the fuzzy logic approach to perform the analysis of the incomplete information and uncertain structure. In 1982, this approach

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proposed by Pawlak, for discover the knowledge from big databases which is used in classification of the attributes recently. Also, Rough set is made as incomplete, inadequate and vague information organizing; it makes it suitable for data analysis (Pawlak, 1994, 1995).

Databases use this data and evaluate managerial decisions in the process of data mining has become imperative that we give the name of the emergence of the field. The rough set is a concept derived from the fuzzy logic approach to carry out the analysis of structures with uncertain data mining techniques. The decision will be developed in conjunction with computerized decision support model, giving more efficient automation systems with algorithms that are targeted. Our suggested decision support system covers the inputs, user knowledge and expertise, outputs and decision components. In addition, data access, interactive mode, adaptability and flexible mode provides the solve problems and make decision process for certain and uncertain data with suggested rough set based algorithm structure.

This paper presents rough set based decision model, a process in which the suggested algorithm and decision support model and evaluate with the knowledge in databases and the knowledge received externally. The following sections include some necessary literature review and the rough based decision model approach. Then follow the future trends and the conclusion.

BACKGROUND

Rough set theory is an extension of set theory which proposed by Pawlak (1991) for describe and classify the incomplete or insufficient information. Besides it is mathematical tool that overcome the uncertainties and doubts. Also it verifies logic, and allows inconsistent data and no certainty to the discovery of incomplete implications. It is made as incomplete, inadequate and vague information by organizing. Rough set organizes the suitable data for analysis.

In real-world applications may includes the some uncertain and incomplete attributes in the knowledge representation systems in dynamic situation, for this reason knowledge discovery and processing is very important for decision system. Meanwhile it is supported as a framework for conceptualizing and analyzing certain and uncertain types of data that is a powerful tool for discovering patterns with upper and lower approximations. Some of the studies used the rough set theory with minimum vertex cover problem (Chen et al.2015; Chen et al.2016); interval-valued information systems (Leung et al. 2008); intuitionistic fuzzy sets (Zhang et al. 2016; Huang et al, 2016) for knowledge discovery in feature selection (Huang et al. 2016) and rule induction (Lin et al. 2015). Shu & Qian (2015) and Yao & Zhao (2008) used the rough set theory for attribute reduction in pre-processing of the data mining and knowledge discovery. Macia-Perez et al. (2015) proposed the formal expansion of the rough set theory based algorithm for detection of the abnormal behaviour in outlier.

Nowadays, rough set theory has been demonstrated to be useful in many research areas such as knowledge discovery (Polkowski et al., 2010, Zhong, 1998; Sun et al., 2012), machine learning (Ananthanarayana et al., 2003; Pedrycz, 2013), decision analysis and support (Yao, 2010; Yao and Zhao, 2008; Pedrycz, 2014), expert systems (Tsumoto, 1998), and pattern recognition (Swinarski and Skowron, 2003). Rough set theory is also seen in the literature, which is used in conjunction with some heuristic algorithms with optimization applications (Changseok et al. 2010 and Yumin et al. 2010). Liu et al (2011) and (Nauman et al. 2016) used the probabilistic model to evaluate the clusters with rough sets approach. Zhong and Skowron (2001) proposed a rule of database in data mining. Liu et al (2011) and Fang et al. (2016) used the rough probabilistic model to evaluate the cluster approach with rough sets approach. As

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