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Generalized three-way decision models based on subset evaluation. (English) Zbl 1404.68168

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Summary: The notion of three-way decisions was originally introduced based on the need to explain the three regions of probabilistic rough sets. In a three-way decision model, every object can be evaluated by a function and according to the evaluation value, the object can be arranged in one of the three regions (i.e., positive, negative, and boundary regions). In this study, we generalize Yao's three-way decision models to a case where every subset in the universe can be evaluated by the evaluation function, and we then propose generalized three-way models. The properties and examples of these new models are presented, as well as extensions of these models. We also give some remarks regarding Hu's three-way decision spaces. Three-way matroids are introduced based on Hu's axiomatic approach and our generalized three-way models. Furthermore, three-way matroids are generalized to three fuzzy matroids as an application of our new model. Finally, we suggest future research related to our new models and three-way fuzzy matroids.

MSC:

68T37 Reasoning under uncertainty in the context of artificial intelligence
05B35 Combinatorial aspects of matroids and geometric lattices

Cited in **9** Documents

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