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Probabilistic $q$-rung orthopair hesitant fuzzy entropy and its application. (Chinese. English summary) [Zbl 1488.94070]

Summary: Combining the advantages of $q$-rung orthopair fuzzy sets and probabilistic hesitant fuzzy sets, the concept of probabilistic $q$-rung orthopair hesitant fuzzy set was proposed, which could express uncertain problems more broadly. Aiming at the influence of hesitant degrees and core values on entropy in probabilistic $q$-rung orthopair hesitant fuzzy set, the geometry construction method about $q$-rung orthopair hesitant fuzzy entropy was presented in order to measure the uncertain information, and the influence of parameter $\alpha$ on entropy was discussed. Furthermore, the concept of generalized probabilistic $q$-rung orthopair hesitant fuzzy entropy was proposed, and the property of the parameter $\lambda$ was discussed. The probabilistic $q$-rung orthopair hesitant fuzzy entropy was applied to multi-attribute decision-making problems, which verified the correctness and rationality of the method.

MSC:
94A17 Measures of information, entropy
94D05 Fuzzy sets and logic (in connection with information, communication, or circuits theory)
91B06 Decision theory
91B86 Mathematical economics and fuzziness

Keywords:
probabilistic $q$-rung orthopair hesitant fuzzy set; probabilistic $q$-rung orthopair hesitant fuzzy entropy; geometry construction; multi-attribute decision-making

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