

An interval type-2 fuzzy permutation method and experimental analysis for multiple criteria decision analysis with incomplete preference information

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Abstrak

The aim of this article was to develop an interval type-2 fuzzy permutation method for addressing multiple criteria decision-making problems under incomplete preference information. Furthermore, this article present an experimental analysis to examine the implementation efficiency and the applicable scope of the proposed method. Interval type-2 fuzzy sets are more capable than ordinary fuzzy sets of handling imprecision and imperfect information in real-world applications. This article used interval type-2 fuzzy sets to capture imprecise or uncertain decision information in fields that require multiple criteria decision analysis. Based on pairwise criterion comparisons of the alternatives using a signed distance-based approach, this article presents a concordance-discordance analysis and propose an integrated programing model in the interval type-2 fuzzy permutation method. Finally, computational experiments with enormous amounts of simulation data are designed to examine the influence of numbers of alternatives and criteria on the implementation efficiency and the applicable scope of the proposed method.