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Consistency of Pythagorean fuzzy preference relation and weighted vector. (Chinese. English summary) [Zbl 07404467]

Summary: Based on the theoretical results of fuzzy preference relation and the closeness index for Pythagorean fuzzy number, the Pythagorean fuzzy preference relation (PFPR) is transformed into the closeness index matrix, and then it is proved that the closeness index matrix is fuzzy preference relation. Then, the additive consistency of PFPR, which is based on the additive consistency of fuzzy preference relation, is defined, and the corresponding computational formula of weighted vectors is obtained. Next, similar to the results of additive consistency of PFPR, multiplicative consistency and the corresponding computational formulas of weighted vectors of PFPR are also developed. Furthermore, in order to judge the consistency of PFPR, the consistent index of PFPR is given based on the consistent index of preference relation and fuzzy preference relation. Finally, a numerical example and comparisons with the existing approach are provided to illustrate the feasibility and effectiveness of the proposed methods.

MSC:
03E72 Theory of fuzzy sets, etc.

Keywords:
Pythagorean fuzzy set; Pythagorean fuzzy preference relation; consistency; closeness index matrix