

An intuitionistic fuzzy multi-criteria decision-making method based on an exponential-related function

Daniel Aikhuele, Faiz Turan

Faculty of Manufacturing Engineering, Universiti Malaysia Pahang, Pekan, Malaysia

ABSTRACT

Intuitionistic fuzzy multiple criteria decision making (MCDM) method which is based on an exponential-related function, adopted in the Technique for order preference by similarity to ideal solution (TOPSIS) has been proposed in this study. The exponential-related function which is used for comparing intuitionistic-fuzzy-sets (IFS), and as a replacement for the traditional exponential score function which is only effective for determining priority weights that involve pairwise-comparison, has been applied, for computing the separation measure from the fuzzy positive and negative ideal solution to determine the relative closeness-coefficients of alternatives. The main advantage of this method includes (1) its ability to account for Decision-makers (DMs) attitudinal-character in the decision-making process as-well-as to represent the aggregated effect of the positive/negative evaluations in the performance ratings of the alternatives based on the IFS-data and (2) The simplicity of the method both in its concept and computational procedures. To demonstrate the feasibility of the method, it has been applied for the evaluation of some hypothetical design-related problems and for a real-life case study.

KEYWORDS

Exponential-related function; Intuitionistic fuzzy entropy; Intuitionistic fuzzy TOPSIS; MCDM

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