Abstract

A large number of multi-criteria methods have been developed to deal with different kinds of problems. Most of them use a linear aggregation, what is the cause of many shortcomings in solving decision problems. This paper presents how to identify nonlinear multi-criteria decision-making models with using the new fuzzy method: the Characteristic Objects Method (COMET). In this approach, models are constructed on the basis of characteristic objects and fuzzy rules. Thereby, the COMET method is free of rank reversal phenomenon, which is one of the most commonly indicated shortcoming of the multi-criteria decisionmaking methods. This study introduces the concepts of characteristic objects and way of their determination. Subsequently, the paper presents approach to construct the fuzzy rule base and the entire model. Finally, the theoretical nonlinear problem is presented to verify the developed approach and to demonstrate its effectiveness.

References

Application of the fuzzy multi-criteria decision-making method to identify nonlinear decision model


- Saaty, TL. 2007. Time dependent decision-making; dynamic priorities in the AHP/ANP: Generalizing from points to functions and from real to complex variables, Mathematical and Computer Modelling Vol. 46 No. 78, pp. 860 – 891.
- Amaral, TM., Costa APC. 2014. Improving decision-making and management of hospital resources: An application of the PROMETHEE II method in an Emergency

**Index Terms**

Computer Science                                                    Applied Mathematics

**Keywords**

Multi-criteria Making-decision Method  Rank Reversal  Decision Making
Characteristic Objects
COMET Method