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On the use of multicriteria classification methods: a simulation study. (English)
Zbl 1059.90084

Summary: The classification of a set of alternatives into predefined homogeneous groups is a problem with major practical interest in many fields. Over the past two decades several non-parametric approaches have been developed to address the classification problem, originating from several scientific fields. Among these approaches, MultiCriteria Decision Aid (MCDA) has several attractive features, involving its decision Support orientation. This paper is focused on the Preference Disaggregation Approach of MCDA (PDA). The objective of this study is to explore whether the attractive features of PDA also lead to higher efficiency in terms of classification accuracy, as opposed to traditional statistical classification procedures. For this purpose an extensive Monte Carlo simulation is conducted. The methods considered in this simulation include a well-known classification method based on the PDA paradigm, namely the UTADIS method (UTilites Additives DIScriminantes), and three statistical classification procedures, namely the linear discriminant analysis, the quadratic discriminant analysis and the logit analysis. The results indicate that the UTADIS method outperforms the considered parametric techniques in the majority of the data conditions that are used in the simulation.

For the entire collection see [Zbl 1048.90002].

MSC:

90B50 Management decision making, including multiple objectives

Keywords:
classification; multicriteria decision aid; Monte Carlo simulation; multivariate statistical analysis