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灰模糊积分关联度决策模型

常志朋¹, 程龙生²

1. 安徽工业大学商学院, 安徽马鞍山 243002;
2. 南京理工大学经济管理学院, 江苏南京 210094

Grey Fuzzy Integral Correlation Degree Decision Model

CHANG Zhi-peng¹, CHENG Long-sheng²

1. School of Business, Anhui University of Technology, Maanshan 243002, China;
2. School of Economics & Management, Nanjing University of Science & Technology, Nanjing 219004, China

摘要

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摘要 灰关联度决策模型是在假设属性之间彼此相互独立的基础上构建的,但是在很多实际问题中属性之间往往存在一定的交互作用,从而导致灰关联度决策模型失效。针对这一问题,引入模糊积分理论,构建了灰模糊积分关联度决策模型。为求解该模型,定义了基于属性权重和属性间交互度的默比乌斯变换系数,来计算2可加模糊测度,其中属性权重通过序关系分析法和施密特正交马田系统共同确定,属性间的交互关系和交互度由专家确定。以廉租房保障家庭经济状况评估为例,对灰模糊积分关联度决策模型和灰关联度决策模型进行比较验证,验证结果表明灰模糊积分关联度决策模型的决策结果更加科学合理,有较好的应用价值。

关键词: 灰关联度 模糊积分 施密特正交马田系统 默比乌斯变换 序关系分析法

Abstract: In grey correlation degree decision model (GRCM), it is assumed that all the attributes are mutually independent. However, in real decision making problems, the interaction often exists between attributes which leads GRCM to lose effectiveness. For this problem, the fuzzy integral theory is introduced and grey fuzzy integral correlation degree decision model (GRFICM) is established. To solve the model, the Mobius transformation coefficients based on weights and interaction degrees are defined to calculate 2-order additive fuzzy measures. In Mobius transformation coefficients, the weights are determined by the rank correlation analysis method and Mahalanobis-Taguchi Gram-Schmidt jointly, and the interaction relations and interaction degrees are judged by experts. An evaluation of the financial situation of low-rent housing safeguard family is provided as a practical case in order to validate GRCM and GRFICM by comparing. The validation results show that GRFICM makes the decision results more scientific and reasonable, and is more worth of spreading.

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作者简介: 常志朋(1978-),男(汉族),吉林榆树人,安徽工业大学商学院副教授,博士,研究方向:多属性决策、管理综合评价等。

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