

论文

基于前景理论的多目标灰靶决策方法

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摘要:

针对权重信息部分已知且属性值为区间数的多目标决策问题, 考虑决策者风险态度对多目标决策的影响, 提出一种基于前景理论的区间数多目标灰靶决策方法. 该方法利用奖优罚劣的区间数线性变换算子对原始决策信息进行规范化处理, 设计正负理想靶心, 并定义前景价值函数. 利用该构建方案建立优化模型以得出最优权向量, 并最终确定出方案的排序. 最后, 通过一个实例验证了该模型适用于具有风险态度特性的区间数多指标决策, 并且表明了模型的有效性和可行性.

关键词: 前景理论 灰靶决策 线性变换算子 价值函数 权重函数

Multi-objective Grey Target Decision-making Based on Prospect Theory

Abstract:

In view of the multi-objective decision problem that the attribute values are interval grey numbers and the attribute weights partially known, considering the impact on the multi-objective decision from risk attitudes, the multi-objective grey target decision-making method based on prospect theory is proposed. Firstly, the interval number linear transformation operator with the features of the “rewarding good and punishing bad” is used to standardize the original decision-making information and get the positive and negative ideal bull’s eye. According to the prospect theory and grey target decision making method, the prospect value function is defined, and an optimization model is built, then the optimum weight vector is solved, and the order of the program is determined. Finally, an example shows the feasibility and effectiveness of the model, and illustrates that the proposed model is suitable used in multi-objective decision making with interval numbers.

Keywords: Prospect theory Grey target decision-making Linear transformation operator Value function Weight function

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