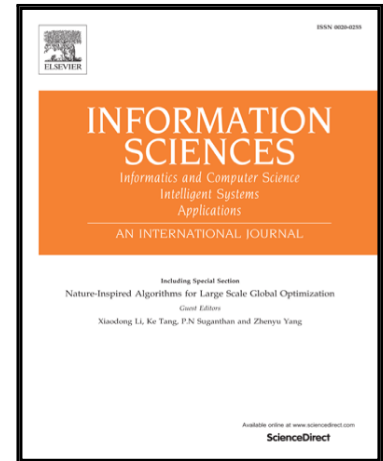


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Hesitant Fuzzy Linguistic Entropy and Cross-Entropy Measures and Alternative Queuing Method for Multiple Criteria Decision Making

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Hesitant Fuzzy Linguistic Entropy and Cross-Entropy Measures and Alternative Queuing Method for Multiple Criteria Decision Making

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Abstract

Hesitant fuzzy linguistic term set (HFLTS) is a useful tool for describing people's subjective cognitions in the process of decision making. Multiple criteria decision making (MCDM) involves two important steps: (1) determining the criteria weights; (2) obtaining a suitable ranking of alternatives. In this paper, we propose some hesitant fuzzy linguistic entropy and cross-entropy measures, and then establish a model for determining the criteria weights, which considers both the individual effect of each hesitant fuzzy linguistic element (HFLE) and the interactive effect between any two HFLEs with respect to each criterion. Additionally, we give a hesitant fuzzy linguistic alternative queuing method (HFL-AQM) to deal with the MCDM problems. The directed graph and the precedence relationship matrix make the calculation processes and the final results much more intuitive. Finally, a case study concerning the tertiary hospital management is made to verify the weight-determining method and the HFL-AQM.

Keywords: Multiple criteria decision making, Hesitant fuzzy linguistic term set, Entropy measures, Cross-entropy measures, Weight-determining method, Alternative queuing method

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