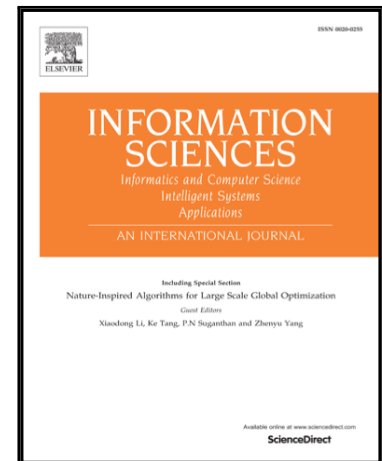


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Shyi-Ming Chen , Wen-Hsin Han

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An improved MADM method using interval-valued intuitionistic fuzzy values

Shyi-Ming Chen^{*}, Wen-Hsin Han

Department of Computer Science and Information Engineering, National Taiwan University of Science and Technology, Taipei, Taiwan

*** Corresponding Author.**

E-mail addresses: smchen@mail.ntust.edu.tw (S.-M. Chen).

Abstract

In this paper, we modify Chen and Han's multiattribute decision making (MADM) method (2018) to propose a novel MADM method based on the non-linear programming (NLP) methodology, Xu's score function (SF) (2007) and Xu's accuracy function (AF) (2007) of interval-valued intuitionistic fuzzy values (IVIFVs), the membership uncertainty (MU) index (2009) and the hesitation uncertainty (HU) index (2009) of IVIFVs, and Wang *et al.*'s ranking method (2009) of IVIFVs. The proposed MADM method can conquer the shortcomings of Chen and Chiou's MADM method (2015), Chen and Han's MADM method (2018), Chen and Huang's MADM method (2017), Li's MADM method (2010) and Zhitao and Yingjun's MADM method (2011).

Keywords: IVIFSs; IVIFVs; Non-linear programming methodology; MADM.

1. Introduction

In 1965, Zadeh proposed the theory of fuzzy sets [24], which has been applied in many fields [3], [7], [8], [20]. In 1986, Atanassov proposed the theory of intuitionistic fuzzy sets (IFSs) [1] based on the extension of fuzzy sets. In recent years, several multiattribute decision making (MADM) methods have been proposed [11], [12], [14],

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