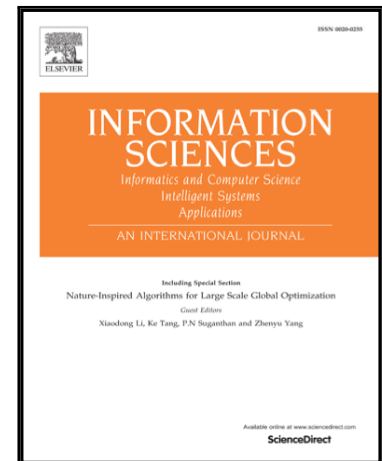


## Accepted Manuscript

Multiattribute decision making based on nonlinear programming methodology, particle swarm optimization techniques and interval-valued intuitionistic fuzzy values

Shyi-Ming Chen , Wen-Hsin Han

PII: S0020-0255(18)30625-X  
DOI: <https://doi.org/10.1016/j.ins.2018.08.021>  
Reference: INS 13865



To appear in: *Information Sciences*

Received date: 10 June 2018  
Revised date: 5 August 2018  
Accepted date: 8 August 2018

Please cite this article as: Shyi-Ming Chen , Wen-Hsin Han , Multiattribute decision making based on nonlinear programming methodology, particle swarm optimization techniques and interval-valued intuitionistic fuzzy values, *Information Sciences* (2018), doi: <https://doi.org/10.1016/j.ins.2018.08.021>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

# Multiattribute decision making based on nonlinear programming methodology, particle swarm optimization techniques and interval-valued intuitionistic fuzzy values

Shyi-Ming Chen<sup>\*</sup>, 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 propose a new multiattribute decision making (MADM) method by applying the nonlinear programming (NLP) methodology and particle swarm optimization (PSO) techniques using interval-valued intuitionistic fuzzy values (IVIFVs) to conquer the drawbacks of Chen and Huang's MADM method (2017), which has three drawbacks, i.e., (1) multiple different preference orders (POs) of alternatives are obtained in some situations, (2) the PO of alternatives cannot be distinguished in some circumstances, and (3) the PO of alternatives cannot be obtained in some circumstances. Moreover, the proposed MADM method also can conquer the shortcomings of Chen and Chiou's MADM method (2015), Li's MADM method (2010) and Zhitao and Yingjun's method (2011).

**Keywords:** IVIFSSs; IVIFVs; Linear programming methodology; Nonlinear programming methodology; MADM.

---

## 1. Introduction

In [39], Zadeh proposed the fuzzy set theory, where the degree of membership of an element belonging to a fuzzy set is described by a real value between zero and one. The fuzzy set theory has been used to deal with students' answerscripts evaluation [3], [33], fuzzy forecasting [7], [15]-[17], multiple attribute group decision making (MAGDM) [13], [36], fuzzy risk analysis [14], fuzzy reasoning [21], [25], fuzzy interpolative reasoning [5], [6], ..., etc. In [1], Atanassov extended the theory of fuzzy sets to propose the theory of intuitionistic fuzzy sets (IFSs). In [4], Chen and Chang presented a similarity measure between IFSs based on transformation techniques to

Download English Version:

<https://daneshyari.com/en/article/10145947>

Download Persian Version:

<https://daneshyari.com/article/10145947>

[Daneshyari.com](https://daneshyari.com)