

On aggregation operators for linguistic trapezoidal fuzzy intuitionistic fuzzy sets and their application to multiple attribute group decision making

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[Ver número de ResearcherID y ORCID de Web of Science](#)

JOURNAL OF INTELLIGENT & FUZZY SYSTEMS

Volumen: 38

Número: 3

Páginas: 2907-2950

DOI: 10.3233/JIFS-181197

Fecha de publicación: 2020

Tipo de documento: Article

[Ver impacto de la revista](#)

Abstract

Linguistic decision-making tools are very useful in determining the solution to real-life decision problems. In order to represent the complex fuzzy qualitative information more accurately, this paper introduces a novel concept called linguistic trapezoidal fuzzy intuitionistic fuzzy set (LTFIFS), where the degrees of membership (MS) and non-membership (NMS) are represented by trapezoidal fuzzy linguistic numbers. Further, work defines some basic operational laws, score and accuracy values, and a comparison method for LTFIFNs with a brief study of related properties. To aggregate different LTFIFNs, we develop several weighted arithmetic and weighted geometric aggregation operators such as the LTFIFWA operator, the LTFIFOWA operator, the LTFIFOWAWA operator, the LTFIFWG operator, the LTFIFOWG operator, and the LTFIFOWGWG operator. Paper also establishes several important properties and particular cases of these operators. Furthermore, by using proposed aggregation operators, we formulate a decision-making approach for solving group decision-making problems under the LTFIF environment with multiple attributes. Finally, the paper presents a real-life decision problem to validate the effectiveness and flexibility of the newly given approach.

Palabras clave

Palabras clave de autor: [Linguistic variable](#); [trapezoidal fuzzy linguistic fuzzy variable](#); [linguistic intuitionistic fuzzy numbers](#); [aggregation operators](#)

KeyWords Plus: [NUMBERS](#); [MODEL](#)

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Financiación

Entidad financiadora	Número de concesión
Chilean Government (Conicyt) through the Fondecyt Postdoctoral program	3170556

[Ver texto de financiación](#)

Editorial

IOS PRESS, NIEUWE HEMWEG 6B, 1013 BG AMSTERDAM, NETHERLANDS

Información de la revista

- **Impact Factor:** [Journal Citation Reports](#)

Categorías / Clasificación

Áreas de investigación: Computer Science

Categorías de Web of Science: Computer Science, Artificial Intelligence

Información del documento

Idioma: English

Número de acceso: WOS:000519701400048

ISSN: 1064-1246

eISSN: 1875-8967