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# Intuitionistic Fuzzy Multicriteria Group Decision Making

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Neutrosophic Sets and Systems

Algebraic Structures of Neutrosophic Triplets, Neutrosophic Duplets, or Neutrosophic Multisets, Volume II

Aggregation Functions Considering Criteria Interrelationships in Fuzzy Multi-Criteria Decision Making: State-of-the-Art

Neutrosophic Sets and Systems, vol. 13/2016

Algebraic Structures of Neutrosophic Triplets, Neutrosophic Duplets, or Neutrosophic Multisets, Volume I

Neutrosophic Sets and Systems, Book Series, Vol. 35, 2020. An International Book Series in Information Science and Engineering

Fuzzy Multi-criteria Decision-Making Using Neutrosophic Sets

Multi-attribute Decision Making based on Rough Neutrosophic Variational Coefficient Similarity Measure

Simplified Neutrosophic Sets Based on Interval Dependent Degree for Multi-Criteria Group Decision-Making Problems

An International Book Series in Information Science and Engineering

12th International Conference, EANN 2011 and 7th IFIP WG 12.5 International Conference, AIAI 2011, Corfu, Greece, September 15-18, 2011, Proceedings

Neutrosophic Information Theory and Applications

NC-TODIM-Based MAGDM under a Neutrosophic Cubic Set Environment

Neutrosophic Multi-Criteria Decision Making

Fuzzy Multiple Attribute Decision Making

TOPSIS Strategy for Multi-Attribute Decision Making with Trapezoidal Neutrosophic Numbers

VIKOR Based MAGDM strategy under Bipolar Neutrosophic Set Environment

A Quarterly International Journal in Information Science and Engineering

Neutrosophic Sets and Systems, vol. 14/2016

Simplified Neutrosophic Linguistic Normalized Weighted Bonferroni Mean Operator and Its Application to Multi-Criteria Decision-Making Problems

Different Linear and Non-Linear Form of Trapezoidal Neutrosophic Numbers, De-Neutrosophication Techniques and Its Application In Time-Cost Optimization Technique, Sequencing Problem

Interval-Valued Intuitionistic Fuzzy Sets

TODIM Method for Group Decision Making under Bipolar Neutrosophic Set Environment

Supply Chain Management: Concepts, Methodologies, Tools, and Applications  
Volume 2

Fuzzy Systems & Operations Research and Management

An improved MULTIMOORA method for multi-valued neutrosophic multi-criteria group decision-making based on prospect theory

Intelligent and Fuzzy Techniques in Big Data Analytics and Decision Making

Algebraic Structures of Neutrosophic Triplets, Neutrosophic Duplets, or Neutrosophic Multisets

Neutrosophic Sets and Systems, book series, Vol. 13, 2016

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*Intuitionistic Fuzzy  
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## MOHAMMED BRONSON

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### Neutrosophic Sets and Systems Infinite Study

Data processing has become essential to modern civilization. The original data for this processing comes from measurements or from experts, and both sources are subject to uncertainty. Traditionally, probabilistic methods have been used to process uncertainty. However, in many practical situations, we do not know the

corresponding probabilities: in measurements, we often only know the upper bound on the measurement errors; this is known as interval uncertainty. In turn, expert estimates often include imprecise (fuzzy) words from natural language such as "small"; this is known as fuzzy uncertainty. In this book, leading specialists on interval, fuzzy, probabilistic uncertainty and their combination describe state-of-the-art developments in their research areas. Accordingly, the book offers a valuable guide for researchers and practitioners interested in data processing under uncertainty, and an introduction to

the latest trends and techniques in this area, suitable for graduate students. *Algebraic Structures of Neutrosophic Triplets, Neutrosophic Duplets, or Neutrosophic Multisets, Volume II* Infinite Study

In this research article, we envisage the neutrosophic number from various distinct rational perspectives & viewpoints to give it a look of a conundrum. We focused & analysed various types of linear and non-linear generalized trapezoidal neutrosophic numbers which serves an indispensable role for uncertainty concept related problem.

*Aggregation Functions Considering Criteria Interrelationships in Fuzzy Multi-Criteria Decision Making: State-of-the-Art* Springer “Neutrosophic Sets and Systems” has been created for publications on advanced studies in neutrosophy, neutrosophic set, neutrosophic logic, neutrosophic probability, neutrosophic statistics that started in 1995 and their applications in any field, such as the neutrosophic structures developed in algebra, geometry, topology, etc. Some articles in this issue: Neutrosophic Soft Fixed Points, Selection of Alternative under the Framework of Single-Valued Neutrosophic Sets, Application of Single Valued Trapezoidal Neutrosophic Numbers in Transportation Problem.

**Neutrosophic Sets and Systems, vol. 13/2016** Springer

In order to keep up with the constant changes in technology, business have adopted supply chain management to improve competitive strategies on a strategic and operational level. Supply Chain Management: Concepts, Methodologies, Tools, and Applications is a reference collection which highlights the major concepts and issues in the

application and advancement of supply chain management. Including research from leading scholars, this resource will be useful for academics, students, and practitioners interested in the continuous study of supply chain management and its influences.

**Algebraic Structures of Neutrosophic Triplets, Neutrosophic Duplets, or Neutrosophic Multisets, Volume I** Infinite Study

A neutrosophic cubic set is the hybridization of the concept of a neutrosophic set and an interval neutrosophic set.

Neutrosophic Sets and Systems, Book Series, Vol. 35, 2020. An International Book Series in Information Science and Engineering IGI Global

The two-volume set IFIP AICT 363 and 364 constitutes the refereed proceedings of the 12th International Conference on Engineering Applications of Neural Networks, EANN 2011, and the 7th IFIP WG 12.5 International Conference, AIAI 2011, held jointly in Corfu, Greece, in September 2011. The 52 revised full papers and 28 revised short papers presented together with 31 workshop papers were carefully

reviewed and selected from 150 submissions. The second volume includes the papers that were accepted for presentation at the AIAI 2011 conference. They are organized in topical sections on computer vision and robotics, classification/pattern recognition, financial and management applications of AI, fuzzy systems, learning and novel algorithms, recurrent and radial basis function ANN, machine learning, generic algorithms, data mining, reinforcement learning, Web applications of ANN, medical applications of ANN and ethics of AI, and environmental and earth applications of AI. The volume also contains the accepted papers from the First Workshop on Computational Intelligence in Software Engineering (CISE 2011) and the Workshop on Artificial Intelligence Applications in Biomedicine (AIAB 2011).

**Fuzzy Multi-criteria Decision-Making Using Neutrosophic Sets** Infinite Study

In this paper, we introduce the concept of neutrosophic number from different viewpoints. We define different types of linear and non-linear generalized triangular neutrosophic numbers which are very important for uncertainty theory. We

introduced the de-neutrosophication concept for neutrosophic number for triangular neutrosophic numbers. This concept helps us to convert a neutrosophic number into a crisp number. The concepts are followed by two application, namely in imprecise project evaluation review technique and route selection problem.

*Multi-attribute Decision Making based on Rough Neutrosophic Variational Coefficient Similarity Measure* Springer Nature Neutrosophy (1995) is a new branch of philosophy that studies triads of the form  $(x, y, z)$ , where  $x$  is an entity (i.e., element, concept, idea, theory, logical proposition, etc.),  $y$  is the opposite of  $x$ , while  $z$  is the neutral (or indeterminate) between them, i.e., neither  $x$  nor  $y$ . Based on neutrosophy, the neutrosophic triplets were founded; they have a similar form:  $(x, neut(x), anti(x))$ , that satisfy some axioms, for each element  $x$  in a given set. This book contains the successful invited submissions to a special issue of *Symmetry*, reporting on state-of-the-art and recent advancements of neutrosophic triplets, neutrosophic duplets, neutrosophic multisets, and their algebraic

structures—that have been defined recently in 2016, but have gained interest from world researchers, and several papers have been published in first rank international journals.

**Simplified Neutrosophic Sets Based on Interval Dependent Degree for Multi-Criteria Group Decision-Making Problems** Springer Science & Business Media

The concept of Information is to disseminate scientific results achieved via experiments and theoretical results in depth. It is very important to enable researchers and practitioners to learn new technology and findings that enable development in the applied field.

**An International Book Series in Information Science and Engineering** Infinite Study

Contributors to current issue (listed in papers' order): Ibrahim Yasser, Abeer Twakol, A. A. Abd El-Khalek, A. A. Salama, Ahmed Sharaf Al-Din, Issam Abu Al-Qasim, Rafif Alhabib, Magdy Badran, Remya P. B, Francina Shalini, Masoud Ghods, Zahra Rostami, A. Sahaya Sudha, Luiz Flavio Autran Monteiro Gomes, K.R. Vijayalakshmi, Prakasam Muralikrishna,

Surya Manokaran, Nidhi Singh, Avishek Chakraborty, Soma Bose Biswas, Malini Majumdar, Rakhal Das, Binod Chandra Tripathy, Nidhi Singh, Avishek Chakraborty, Nilabhra Paul, Deepshikha Sarma, Akash Singh, Uttam Kumar Bera, Fatimah M. Mohammed, Sarah W. Raheem, Muhammad Riaz, Florentin Smarandache, Faruk Karaaslan, Masooma Raza Hashmi, Iqra Nawaz, Kousik Das, Sovan Samanta, Kajal De, Xavier Encarnacion, Nivetha Martin, I. Pradeepa, N. Ramila Gandhi, P. Pandiammal, Aiman Muzaffar, Md Tabrez Nafis, Shahab Saquib Sohail, Abhijit Saha, Jhulaneswar Baidya, Debjit Dutta, Irfan Deli, Said Broumi, Mohsin Khalid, Neha Andaleeb Khalid, Md. Hanif Page, Qays Hatem Imran, Shilpi Pal, S. Satham Hussain, Saeid Jafari, N. Durga, Hanieh Shambayati, Mohsen Shafiei Nikabadi, Seyed Mohammad, Ali Khatami Firouzabadi, Mohammad Rahmanimanesh, Mujahid Abbas, Ghulam Murtaza, K. Porselvi, B. Elavarasan, Y. B. Jun, Chinnadurai V, Sindhu M P, K.Radhika, K. Arun Prakash, Malayalan Lathamaheswari, Ruipu Tan, Deivanayagampillai Nagarajan, Talea Mohamed, Assia Bakali, Nivetha Martin, R. Dhavaseelan, Ali Hussein

Mahmood Al-Obaidi, Suman Das, Surapati Pramanik, Madad Khan, Muhammad Zeeshan, Saima Anis, Abdul Sami Awan, M. Sarwar Sindhu, Tabasam Rashid, Agha Kashif, Rajesh Kumar Saini, Atul Sangal, Manisha.

*12th International Conference, EANN 2011 and 7th IFIP WG 12.5 International Conference, AIAI 2011, Corfu, Greece, September 15-18, 2011, Proceedings*  
Infinite Study

This book includes the proceedings of the Intelligent and Fuzzy Techniques INFUS 2019 Conference, held in Istanbul, Turkey, on July 23–25, 2019. Big data analytics refers to the strategy of analyzing large volumes of data, or big data, gathered from a wide variety of sources, including social networks, videos, digital images, sensors, and sales transaction records. Big data analytics allows data scientists and various other users to evaluate large volumes of transaction data and other data sources that traditional business systems would be unable to tackle. Data-driven and knowledge-driven approaches and techniques have been widely used in intelligent decision-making, and they are increasingly attracting attention due to

their importance and effectiveness in addressing uncertainty and incompleteness. INFUS 2019 focused on intelligent and fuzzy systems with applications in big data analytics and decision-making, providing an international forum that brought together those actively involved in areas of interest to data science and knowledge engineering. These proceeding feature about 150 peer-reviewed papers from countries such as China, Iran, Turkey, Malaysia, India, USA, Spain, France, Poland, Mexico, Bulgaria, Algeria, Pakistan, Australia, Lebanon, and Czech Republic.

#### **Neutrosophic Information Theory and Applications**

Fuzzy Multi-criteria Decision-Making Using Neutrosophic Sets  
In this paper, we extend the VIKOR (Vlsekriterijumska optimizacija i KOmpromisno Resenje) strategy to multiple attribute group decision-making (MAGDM) with bipolar neutrosophic set environment. In this paper, we first define VIKOR strategy in bipolar neutrosophic set environment to handle MAGDM problems, which means we combine the VIKOR with bipolar neutrosophic number to deal with MAGDM.

#### **NC-TODIM-Based MAGDM under a Neutrosophic Cubic Set Environment**

MDPI  
This book offers a comprehensive guide to the use of neutrosophic sets in multiple criteria decision making problems. It shows how neutrosophic sets, which have been developed as an extension of fuzzy and paraconsistent logic, can help in dealing with certain types of uncertainty that classical methods could not cope with. The chapters, written by well-known researchers, report on cutting-edge methodologies they have been developing and testing on a variety of engineering problems. The book is unique in its kind as it reports for the first time and in a comprehensive manner on the joint use of neutrosophic sets together with existing decision making methods to solve multi-criteria decision-making problems, as well as other engineering problems that are complex, hard to model and/or include incomplete and vague data. By providing new ideas, suggestions and directions for the solution of complex problems in engineering and decision making, it represents an excellent guide for researchers, lecturers and postgraduate

students pursuing research on neutrosophic decision making, and more in general in the area of industrial and management engineering.

### **Neutrosophic Multi-Criteria Decision Making** Springer

“Neutrosophic Sets and Systems” has been created for publications on advanced studies in neutrosophy, neutrosophic set, neutrosophic logic, neutrosophic probability, neutrosophic statistics that started in 1995 and their applications in any field, such as the neutrosophic structures developed in algebra, geometry, topology, etc.

### Fuzzy Multiple Attribute Decision Making Infinite Study

Technique for Order Preference by Similarity to Ideal Solution (TOPSIS) is a popular strategy for Multi-Attribute Decision Making (MADM). In this paper, we extend the TOPSIS strategy of MADM problems in trapezoidal neutrosophic number environment.

### **TOPSIS Strategy for Multi-Attribute Decision Making with Trapezoidal Neutrosophic Numbers** Springer

Science & Business Media  
Neutrosophy (1995) is a new branch of

philosophy that studies triads of the form  $(\alpha, \beta, \gamma)$ , where  $\alpha$  is an entity {i.e. element, concept, idea, theory, logical proposition, etc.},  $\beta$  is the opposite of  $\alpha$ , while  $\gamma$  is the neutral (or indeterminate) between them, i.e., neither  $\alpha$  nor  $\beta$ . Based on neutrosophy, the neutrosophic triplets were founded, which have a similar form  $(x, \text{neut}(x), \text{anti}(x))$ , that satisfy several axioms, for each element  $x$  in a given set. This collective book presents original research papers by many neutrosophic researchers from around the world, that report on the state-of-the-art and recent advancements of neutrosophic triplets, neutrosophic duplets, neutrosophic multisets and their algebraic structures – that have been defined recently in 2016 but have gained interest from world researchers.

Connections between classical algebraic structures and neutrosophic triplet / duplet / multiset structures are also studied. And numerous neutrosophic applications in various fields, such as: multi-criteria decision making, image segmentation, medical diagnosis, fault diagnosis, clustering data, neutrosophic probability, human resource management, strategic planning, forecasting model, multi-

granulation, supplier selection problems, typhoon disaster evaluation, skin lesion detection, mining algorithm for big data analysis, etc.

### Infinite Study

### Fuzzy Multi-criteria Decision-Making Using Neutrosophic Sets

 Springer

### VIKOR Based MAGDM strategy under Bipolar Neutrosophic Set Environment

### Infinite Study

Information management is a common paradigm in modern decision-making. A wide range of decision-making techniques have been proposed in the literature to model complex business and engineering processes. In this Special Issue, 16 selected and peer-reviewed original research articles contribute to business information management in various current real-world problems by proposing crisp or uncertain multiple-criteria decision-making (MCDM) models and techniques, mostly including multi-attribute decision-making (MADM) approaches, in addition to a single paper proposing an interactive multi-objective decision-making (MODM) approach. Particular attention is devoted to information aggregation operators—65%

of papers dealt with this item. The topics of this Special Issue gained attention in Europe and Asia. A total of 48 authors from seven countries contributed to this Issue. The papers are mainly concentrated in three application areas: supplier selection and rational order allocation, the evaluation and selection of goods or facilities, and personnel selection/partner selection. A number of new approaches are proposed that are expected to attract great interest from the research community.

*A Quarterly International Journal in Information Science and Engineering*  
Infinite Study

At present, there are many subways being

constructed in many cities. In the construction of subways, an appropriate scheme is helpful to save cost and ensure the quality of the project. This paper attaches great importance to present a multi-criteria group decision-making (MCGDM) method to deal with selecting an appropriate construction scheme for subways. The process of selecting an appropriate construction scheme for subways is complex because it includes a great deal of fuzzy and uncertain information which can be presented by multi-valued neutrosophic numbers (MVNNs). In addition, in order to handle the interaction of inputs, an improved

generalized multi-valued neutrosophic weighted Heronian mean (IGMVNWHM) operator is introduced. Subsequently, a new distance measure between two MVNNs is defined for deriving the objective criteria weights.

*Neutrosophic Sets and Systems*, vol. 14/2016 Infinite Study

The research activities in group decision making have dramatically increased over the last decade. In particular, the application of multiple attribute decision-making methods to group decision-making problems occupies a vast area in the related literature. However, there is no systematic classification scheme for these researches.

Related with Intuitionistic Fuzzy Multicriteria Group Decision Making:

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