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Strategic Approach in Multi-criteria Decision Making CRC Press
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.
Multiple Criteria Decision Analysis in Regional Planning John Wiley & Sons
Data and its processed state 'information' have become an indispensable resource for virtually all aspects of business, education, etc. Consequently, decisions regarding the handling of this data, transforming it into meaningful information, and ultimately arriving at the best course of action have taken on a new importance. This book highlights a selection of cutting-edge research on decision making presented at the 25th International Conference on Multiple Criteria Decision Making (MCDM 2019), held in Istanbul, Turkey.
Symmetry, vol. 9, issue 10 / 2007 - Special Issue: Neutrosophic Theories Applied in Engineering John Wiley & Sons
Multi-Actor Multi-Criteria Analysis (MAMCA) developed by Professor Cathy Macharis enables decision-makers within the sectors of transport, mobility and logistics to account for conflicting stakeholder interests. This book draws on 15 years of research and application during which MAMCA has been deployed to support sustainable decisions within the transport and mobility sectors.
Improved TODIM Method Based on Linguistic Neutrosophic Numbers for Multicriteria Group Decision-Making Springer Nature
Employing the concept and function of tangency with similarity measures and counterpart distances for reliable medical consultations has been extensively studied in the past decades and results in lots of isomorphic measures for application. We compared the majority of such isomorphic measures proposed by various researchers and classified them into (a) maximum norm and (b) one-norm categories. Moreover, we found that previous researchers used monotonic functions to transform an identity function and resulted in complicated expressions. In this study, we provide a theoretical foundation to explain the isomorphic nature of a newer measure proposed by the following research

paper against its studied existing one in deriving the same pattern recognition results. Specifically, this study initially proposes two similarity measures using maximum norm, arithmetic mean, and aggregation operators and followed by a detailed discussion on their mathematical characteristics. Subsequently, a simplified version of such measures is presented for easy application. This study completely covers two previous methods to point out that the complex approaches used were unnecessary. The findings will help physicians, patients, and their family members to obtain a proper medical diagnosis during multiple examinations.

Advanced Studies in Multi-Criteria Decision Making Springer

Multiple Criteria Decision Aid is a field which has seen important developments in the last few years. This is not only illustrated by the increasing number of papers and communications in the scientific journals and Congresses, but also by the activities of several international working groups. In 1983, a first Summer School was organised at Catania (Sicily) to promote multicriteria decision-aid in companies and to encourage specialists to exchange didactic material. The second School was held in 1985 at Narnur (Belgium) and I am pleased now to present the selected readings from the "Third International Summer School on Multicriteria Decision Aid: Methods, Applications and Software", which took place in Monte Estoril (Portugal), in 1988. was the quality of the contributions presented by the Such during the Summer School that I have decided to take lecturers advantage of this opportunity to produce a more carefully prepared and homogeneous book rather than a simple volume of proceedings. All the initial versions of the selected papers were revised and some, although not included in the programme of the School, were written in order to give a more complete overview of the MCDA field.

A linguistic Neutrosophic Multi-Criteria Group Decision-Making Method to University Human Resource Management Springer Science & Business Media

This book presents a collection of recent research on topics related to Pythagorean fuzzy set, dealing with dynamic and complex decision-making problems. It discusses a wide range of theoretical and practical information to the latest research on Pythagorean fuzzy sets, allowing readers to gain an extensive understanding of both fundamentals and applications. It aims at solving various decision-making problems such as medical diagnosis, pattern recognition, construction problems, technology selection, and more, under the Pythagorean fuzzy environment, making it of much value to students, researchers, and professionals associated with the field.

A Novel Selection Model of Surgical Treatments for Early Gastric Cancer Patients Based on Heterogeneous Multicriteria Group Decision-Making Springer Science & Business Media

The point of departure in the present book is that the decision makers, involved in the evaluation of alternatives under conflicting criteria, express their preferential judgement by estimating ratios of subjective values or differences of the corresponding logarithms, the so-called grades. Three MCDA methods are studied in detail: the Simple Multi-Attribute Rating Technique SMART, as well as the Additive and the Multiplicative AHP, both pairwise-comparison methods which do not suffer

from the well-known shortcomings of the original Analytic Hierarchy Process. Context-related preference modelling on the basis of psycho-physical research in visual perception and motor skills is extensively discussed in the introductory chapters. Thereafter many extensions of the ideas are presented via case studies in university administration, health care, environmental assessment, budget allocation, and energy planning at the national and the European level. The issues under consideration are: group decision making with inhomogeneous power distributions, the search for a compromise solution, resource allocation and fair distributions, scenario analysis in long-term planning, conflict analysis via the pairwise comparison of concessions, and multi-objective optimization. The final chapters are devoted to the fortunes of MCDA in the hands of its designers. The research started in the late seventies, when I got involved in three different problems: the nomination procedures in a university, the evaluation of alternative energy-research proposals, and the evaluation of non-linear programming software.

Fuzzy Multicriteria Decision-Making

Springer Science & Business Media

The investment in and development of mineral resources play an important role in the national economy. A good mining project investment can improve economic efficiency and increase social wealth. Faced with the complexity and uncertainty of a mine’s circumstances, there is great significance in evaluating investment risk scientifically.

Multiple-Criteria Decision-Making (MCDM) Techniques for Business Processes Information Management

MDPI

This textbook presents methodologies and applications associated with multiple criteria decision analysis (MCDA), especially for those students with an interest in industrial engineering. With respect to methodology, the book covers (1) problem structuring methods; (2) methods for ranking multi-dimensional deterministic outcomes including multiattribute value theory, the analytic hierarchy process, the Technique for Order Preference by Similarity to Ideal Solution (TOPSIS), and outranking techniques; (3) goal programming,; (4) methods for describing preference structures over single and multi-dimensional probabilistic outcomes (e.g., utility functions); (5) decision trees and influence diagrams; (6) methods for determining input probability distributions for decision trees, influence diagrams, and general simulation models; and (7) the use of simulation modeling for decision analysis. This textbook also offers: · Easy to follow descriptions of how to apply a wide variety of MCDA techniques · Specific examples involving multiple objectives and/or uncertainty/risk of interest to industrial engineers · A section on outranking techniques ; this group of techniques, which is popular in Europe, is very rarely mentioned as a methodology for MCDA in the United States · A chapter on simulation as a useful tool for MCDA, including ranking & selection procedures. Such material is rarely covered in courses in decision analysis · Both material review questions and problems at the end of each chapter . Solutions to the exercises are found in the Solutions Manual which will be provided along with PowerPoint slides for each chapter. The methodologies are demonstrated through the use of applications of interest to industrial engineers, including those involving product mix optimization, supplier

selection, distribution center location and transportation planning, resource allocation and scheduling of a medical clinic, staffing of a call center, quality control, project management, production and inventory control,and so on. Specifically, industrial engineering problems are structured as classical problems in multiple criteria decision analysis, and the relevant methodologies are demonstrated.

Multi-criteria Decision Analysis Infinite Study

This monograph is intended for an advanced undergraduate or graduate course of engineering and management science. as well as for persons in business. industry. military or in any field. who want an introductory and a capsule look into the methods of group decision making under multiple criteria. This is a sequel to our previous works entitled "Multiple Objective Decision Making--Methods and Applications (No. 164 of the Lecture Notes). and "Multiple Attribute Decision Making--Methods and Applications (No. 186 of the Lecture Notes). Moving from a single decision maker (the consideration of Lecture Notes 164 and 186) to a multiple decision maker setting introduces a great deal of complexity into the analysis. The problem is no longer the selection of the most preferred alternative among the nondominated solutions according to one individual's (single decision maker's) preference structure. The analysis is extended to account for the conflicts among different interest groups who have different objectives. goals. and so forth. Group decision making under multiple criteria includes such diverse and interconnected fields as preference analysis. utility theory. social choice theory. committee decision theory. theory of voting. game theory. expert evaluation analysis. aggregation of qualitative factors. economic equilibrium theory. etc; these are simplified and systematically classified for beginners. This work is to provide readers with a capsule look into the existing methods. their characteristics. and applicability in the complexity of group decision making.

Multiple-Criteria Decision-Making (MCDM) Techniques for Business Processes Information Management

Springer Science & Business Media

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.
Handbook of Group Decision and Negotiation Infinite Study
Multicriterion Decision in Management: Principles and Practice is the first multicriterion analysis book devoted exclusively to discrete multicriterion decision making. Typically, multicriterion analysis is used in two distinct frameworks: Firstly, there is multiple criteria linear programming, which is an extension of the results of linear programming and its associated algorithms. Secondly, there is discrete multicriterion decision making, which is concerned with choices among a finite number of possible alternatives such as projects, investments, decisions, etc. This is the focus of this book. The book concentrates on the basic principles in the domain of discrete multicriterion analysis, and examines each of these principles in terms of their properties and their implications. In multicriterion decision analysis, any optimum in the strict sense of the term does not exist. Rather, multicriterion decision making utilizes tools, methods, and thinking to examine several solutions, each having their advantages and disadvantages, depending on one's point of view. Actually, various methods exist for reaching a good choice in a multicriterion setting and even a complete ranking of the alternatives. The book describes and compares these methods, so-called `aggregation methods', with their advantages and their shortcomings. Clearly, organizations are becoming more complex, and it is becoming harder and harder to disregard complexity of points of view, motivations, and objectives. The day of the single objective (profit, social environment, etc.) is over and the wishes of all those involved in all their diversity must be taken into account. To do this, a basic knowledge of multicriterion decision analysis is necessary. The objective of this book is to supply that knowledge and enable it to be applied. The book is intended for use by practitioners (managers, consultants), researchers, and students in engineering and business.
Fuzzy Multiple Attribute Decision Making Edward Elgar Publishing
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,

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Multiple Criteria Decision Analysis for Industrial Engineering Infinite Study Multiple Criteria Decision Making (MCDM) is all about making choices in the presence of multiple conflicting criteria. MCDM has become one of the most important and fastest growing subfields of Operations Research/Management Science. As modern MCDM started to emerge about 50 years ago, it is now a good time to take stock of developments. This book aims to present an informal, nontechnical history of MCDM, supplemented with many pictures. It covers the major developments in MCDM, from early history until now. It also covers fascinating discoveries by Nobel Laureates and other prominent scholars.The book begins with the early history of MCDM, which covers the roots of MCDM through the 1960s. It proceeds to give a decade-by-decade account of major developments in the field starting from the 1970s until now. Written in a simple and accessible manner, this book will be of interest to students, academics, and professionals in the field of decision sciences.

Decision-Making for Sustainable Transport and Mobility IGI Global This book is devoted to presenting theoretical fundamentals for the methods of multiple criteria decision making (MCDM) in the social sciences with particular intent to their applicability to real-world decision making. The main characteristics of the complex problems facing humans in the world today are multidimensional and have multiple objecti ves; they are large-scale, and have nonconimensura te and conflicting objectives, such as economic, environmental, societal, technical, and aesthetic ones. The authors intend to establish basic concepts for treating these complex problems and to present methodological discussions for MCDM with some applications to administrative, or regional, planning. MCDM is composed of two phases: analytical and judgmental. In this book, we intend to consolidate these two phases and to present integrated methodologies for manipulating them with particular interest in managerial decision making, which has not yet been properly treated in spite of its urgent necessi ty. Al though a number of books in MCDM fields have already been published in recent years, most of them have mainly trea ted one aspect of MCDM. Our work specifically intends to trea t the methodology in unified systems and to construct a conceptual structure with special regards to the intrinsic properties of MCDM and its "economic meanings" from the social scientific point of view.

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

Fuzzy Multicriteria Decision-Making: Models, Algorithms and Applications addresses theoretical and practical gaps in considering uncertainty and multicriteria factors encountered in the design, planning, and control of complex systems. Including all prerequisite

knowledge and augmenting some parts with a step-by-step explanation of more advanced concepts, the authors provide a systematic and comprehensive presentation of the concepts, design methodology, and detailed algorithms. These are supported by many numeric illustrations and a number of application scenarios to motivate the reader and make some abstract concepts more tangible. Fuzzy Multicriteria Decision-Making: Models, Algorithms and Applications will appeal to a wide audience of researchers and practitioners in disciplines where decision-making is paramount, including various branches of engineering, operations research, economics and management; it will also be of interest to graduate students and senior undergraduate students in courses such as decision making, management, risk management, operations research, numerical methods, and knowledge-based systems.

Pythagorean Fuzzy Sets Imperial College Press

axiomatic results should be at the heart of such a science. Through them, we should be able to enlighten and scientifically assist decision-making processes especially by: - making that wh ich is objective stand out more c1early from that which is less objective; - separating robust from fragile conc1usions; - dissipating certain forms of misunderstanding in communication; - avoiding the pitfall of illusory reasoning; - emphasizing, once they are understood, incontrovertible results. The difficulties I encountered at the begining of my career as an operations researcher, and later as a consultant, made me realize that there were some limitations on objectivity in decision-aiding. In my opinion, five major aspects must be taken into consideration: 1) The borderline (or frontier) between what is and what is not feasible is often fuzzy. Moreover, this borderline is frequently modified in light of what is found from the study itself. 2) In many real-world problems, the "decision maker D" does not really exist as a person truly able to make adecision. Usually, several people (actors or stakeholders) take part in the decision process, and it is important not to confuse the one who ratifies adecision with the so-called decision maker in the decision ai ding process. This decision maker is in fact the person or the set of persons for whom or in the name of whom decision aiding effort is provided.

Trends in Multiple Criteria Decision Analysis Springer

This Special Issue presents original research papers that report on state-of-the-art and recent advancements in neutrosophic sets and logic in soft computing, artificial intelligence, big and small data mining, decision making problems, and practical achievements.

Multiple Criteria Decision Making Infinite Study

At a practical level, mathematical programming under multiple objectives has emerged as a powerful tool to assist in the process of searching for decisions which best satisfy a multitude of conflicting objectives, and there are a number of distinct methodologies for multicriteria decision-making problems that exist. These methodologies can be categorized in a variety of ways, such as form of model (e.g. linear, non-linear, stochastic), characteristics of the decision space (e.g. finite or infinite), or solution process (e.g. prior specification of preferences or interactive). Scientists from a variety of disciplines (mathematics, economics and psychology) have contributed to the

development of the field of Multicriteria Decision Making (MCDM) (or Multicriteria Decision Analysis (MCDA), Multiattribute Decision Making (MADM), Multiobjective Decision Making (MODM), etc.) over the past 30 years, helping to establish MCDM as an important part of management science. MCDM has become a central component of studies in management science, economics and industrial engineering in many universities worldwide. Multicriteria Decision Making: Advances in MCDM Models, Algorithms, Theory and Applications aims to bring together `state-of-the-art' reviews and the most recent advances by leading experts on the fundamental theories, methodologies and applications of MCDM. This is aimed at graduate students and researchers in mathematics, economics, management and engineering, as well as at practicing management scientists who wish to better understand the principles of this new and fast developing field.

Multicriterion Decision in Management Springer Science & Business Media

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 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. 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.

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