Application Of Fuzzy Logic And Analytical Hierarchy

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Intelligent and Fuzzy Techniques in Big Data Analytics and Decision Making Cengiz Kahraman 2019-07-05 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.
Fuzzy Analytical Hierarchy Process Approach for Multicriteria Decision-Making with an Application to Developing an 'Urban Greenness Index' Myrtha Elvia Reyna Vargas 2018 Urban greenness is a multifaceted concept that describes greenness in a built environment. Current approaches studying health outcomes quantify greenness one-dimensionally, leading to the necessity of developing an index that accurately reflects greenness aspects in an urban setting. This thesis integrates Analytical Hierarchy Process with fuzzy logic (fuzzy-AHP) to develop an index based on opinions about urban greenness and on objective attribute data. Index attribute weights are obtained by triangular, trapezoidal and Gaussian membership functions; geometric mean method and fuzzy extent analysis are applied to obtain fuzzy weights. Defuzzification is performed by modal value dominancy and alpha-cuts. A numerical application is shown and resulting indices are compared. The developed 'Urban Greenness Index' represents a more accurate reflection of the true exposure by incorporating multiple aspects of the urban environment. After obtaining experts input on index attributes, this index can be used to explore associations to different health outcomes.
Perceptual Computing Jerry Mendel 2010-07-16 Explains for the first time how "computing with words" can aid in making subjective judgments Lotfi Zadeh, the father of fuzzy logic, coined the phrase "computing with words" (CWW) to describe a methodology in which the objects of computation are words and propositions drawn from a natural language. Perceptual Computing explains how to implement CWW to aid in the important area of making subjective judgments, using a methodology that leads to an interactive device—a "Perceptual Computer"—that propagates random and linguistic uncertainties into the subjective judgment in a way that can be modeled and observed by the judgment maker. This book focuses on the three components of a Perceptual Computer—encoder, CWW engines, and decoder—and then provides detailed applications for each. It uses interval type-2 fuzzy sets (IT2 FSs) and fuzzy logic as the mathematical vehicle for perceptual computing, because such fuzzy sets can model first-order linguistic uncertainties whereas the usual kind of fuzzy sets cannot. Drawing upon the work on subjective judgments that Jerry Mendel and his students completed over the past decade, Perceptual Computing shows readers how to: Map word-data with its inherent uncertainties into an IT2 FS that captures these uncertainties Use uncertainty measures to quantify linguistic uncertainties Compare IT2 FSs by using similarity and rank Compute the subsethood of one IT2 FS in another such set Aggregate disparate data, ranging from numbers to uniformly weighted intervals to nonuniformly weighted intervals to words Aggregate multiple-fired IF-THEN rules so that the integrity of word IT2 FS models is preserved Free MATLAB-based software is also available online so readers can apply the methodology of perceptual computing immediately, and even try to improve upon it. Perceptual Computing is an important go-to for researchers and students in the fields of artificial intelligence and fuzzy logic, as well as for operations researchers, decision makers, psychologists, computer scientists, and computational intelligence experts.
Journal of Applied Operational Research Kaveh Sheibani 2012-06-30 We are pleased to welcome readers to this issue of the Journal of Applied Operational Research (JAOR), Volume 4, Number 2. The journal reports on developments in all aspects of operational research, including the latest advances and applications. It is a primarily goal of the journal to focus on and publish practical case studies which illustrate real-life applications.
Spatial Modeling in GIS and R for Earth and Environmental Sciences Hamid Reza Pourghasemi 2019-01-18 Spatial Modeling in GIS and R for Earth and Environmental Sciences offers an integrated approach to spatial modelling using both GIS and R. Given the importance of Geographical Information Systems and geostatistics across a variety of

applications in Earth and Environmental Science, a clear link between GIS and open source software is essential for the study of spatial objects or phenomena that occur in the real world and facilitate problem-solving. Organized into clear sections on applications and using case studies, the book helps researchers to more quickly understand GIS data and formulate more complex conclusions. The book is the first reference to provide methods and applications for combining the use of R and GIS in modeling spatial processes. It is an essential tool for students and researchers in earth and environmental science, especially those looking to better utilize GIS and spatial modeling. Offers a clear, interdisciplinary guide to serve researchers in a variety of fields, including hazards, land surveying, remote sensing, cartography, geophysics, geology, natural resources, environment and geography Provides an overview, methods and case studies for each application Expresses concepts and methods at an appropriate level for both students and new users to learn by example

Computers in Earth and Environmental Sciences Hamid Reza Pourghasemi 2021-09-22 Computers in Earth and Environmental Sciences: Artificial Intelligence and Advanced Technologies in Hazards and Risk Management addresses the need for a comprehensive book that focuses on multi-hazard assessments, natural and manmade hazards, and risk management using new methods and technologies that employ GIS, artificial intelligence, spatial modeling, machine learning tools and meta-heuristic techniques. The book is clearly organized into four parts that cover natural hazards, environmental hazards, advanced tools and technologies in risk management, and future challenges in computer applications to hazards and risk management. Researchers and professionals in Earth and Environmental Science who require the latest technologies and advances in hazards, remote sensing, geosciences, spatial modeling and machine learning will find this book to be an invaluable source of information on the latest tools and technologies available. Covers advanced tools and technologies in risk management of hazards in both the Earth and Environmental Sciences Details the benefits and applications of various technologies to assist researchers in choosing the most appropriate techniques for purpose Expansively covers specific future challenges in the use of computers in Earth and Environmental Science Includes case studies that detail the applications of the discussed technologies down to individual hazards

Multimedia and Network Information Systems Kazimierz Choro? 2018-09-04 These proceedings collect papers presented at the 11th International Conference on Multimedia & Network Information Systems (MISSI 2018), held from 12 to 14 September 2018 in Wroc?aw, Poland. The keynote lectures, given by four outstanding scientists, are also included here. The Conference attracted a great number of scientists from across Europe and beyond, and hosted the 6th International Workshop on Computational Intelligence for Multimedia Understanding as well as four special sessions. The majority of the papers describe various artificial intelligence (AI) methods applied to multimedia and natural language (NL) processing; they address hot topics such as virtual and augmented reality, identity recognition, video summarization, intelligent audio processing, accessing multilingual information and opinions, video games, and innovations in Web technologies. Accordingly, the proceedings provide a cutting-edge update on work being pursued in the rapidly evolving field of Multimedia and Internet Information Systems.

Rainfall Thresholds and Other Approaches for Landslide Prediction and Early Warning Samuele Segoni 2021-06-22 Landslides are destructive processes causing casualties and damage worldwide. The majority of the landslides are triggered by intense and/or prolonged rainfall. Therefore, the prediction of the occurrence of rainfall-induced landslides is an important scientific and social issue. To mitigate the risk posed by rainfall-induced landslides, landslide early warning systems (LEWS) can be built and applied at different scales as effective non-structural mitigation measures. Usually, the core of a LEWS is constituted of a mathematical model that predicts landslide occurrence in the monitored areas. In recent decades, rainfall thresholds have become a widespread and well established technique for the prediction of rainfall-induced landslides, and for the setting up of prototype or operational LEWS. A rainfall threshold expresses, with a mathematic law, the rainfall amount that, when reached or exceeded, is likely to trigger one or more landslides. Rainfall thresholds can be defined with relatively few parameters and are very straightforward to operate, because their application within LEWS is usually based only on the comparison of monitored and/or forecasted rainfall. This Special Issue collects contributions on the recent research advances or well-documented applications of rainfall thresholds, as well as other innovative methods for landslide prediction and early warning. Contributions regarding the description of a LEWS or single components of LEWS (e.g., monitoring approaches, forecasting models, communication strategies, and emergency management) are also welcome. We encourage, in particular, the submission of contributions concerning the definition and validation of rainfall thresholds, and their operative implementation in LEWS. Other approaches for the forecasting of landslides are also of interest, such as physically based modelling, hazard mapping, and the monitoring of hydrologic and geotechnical indicators, especially when described in the framework of an operational or prototype early warning system.

Impact of Climate Change, Land Use and Land Cover, and Socio-economic Dynamics on Landslides Raju Sarkar 2022-01-03 This book discusses the impact of climate change, land use and land cover, and socio-economic dynamics on landslides in Asian countries. Scholars recently have brought about a shift in their focus regarding triggering factors for landslides, from rainfall or earthquake to claiming rapid urbanization, extreme population pressure, improper land use planning, illegal hill cutting for settlements and indiscriminate deforestation. This suggests that the occurrence or probabilities of landslides are shaped by both climate-related and non-climate-related anthropogenic factors. Among these issues, land use and land cover change or improper land use planning is one of the key factors. Further climate change shapes the rainfall pattern and intensity in different parts of the world, and consequently rainfall-triggered landslides have increased. These changes cause socio-economic changes. Conversely, socio-economic and lifestyle changes enhance inappropriate land use and climate change. All these changes in land use, climate and socio-economic aspects are dynamics in nature and shape landslide risks in Asian countries, where they are given serious attention by governments, disaster management professionals, researchers and academicians. This book comprises 21 chapters divided into three

major sections highlighting the effect of climate change on landslide incidence with the influence on vegetation and socio-economic aspects. The sections address how climate change and extreme events have triggered landslides. The advances in geospatial techniques with the focus on land use and land cover change along with the effect on socio-economic aspects are also explored.

Environmental Applications of Remote Sensing Maged Marghany 2016-06-08 Nowadays, the innovation in space technologies creates a new trend for the Earth observation and monitoring from space. This book contains high quality and compressive work on both microwave and optical remote sensing applications. This book is divided into five sections: (i) remote sensing for biomass estimation, (ii) remote sensing-based glacier studies, (iii) remote sensing for coastal and ocean applications, (iv) sewage leaks and environment disasters, and (v) remote sensing image processing. Each chapter offers an opportunity to expand the knowledge about various remote sensing techniques and persuade researchers to deliver new research novelty for environment studies.

Application of Analytic Hierarchy Process and Fuzzy Logic to Energy Resources Allocation Youssef Mohamad Shatila 2000

Applications of Fuzzy Logic in Planning and Operation of Smart Grids Mehdi Rahmani-Andebili 2021-05-24 Fuzzy logic has vast applications in power and electrical engineering. This collection is the first book to cover research advancements in the application of fuzzy logic in the planning and operation of smart grids. A global group of researchers and scholars present innovative approaches to fuzzy-based smart grid planning and operation, cover theoretical concepts and experimental results of the application of fuzzy-based techniques, and define and apply these techniques to deal with smart grid issues. Applications of Fuzzy Logic in Planning and Operation of Smart Grids is an ideal resource for researchers on the theory and application of fuzzy logic, practicing engineers working in electrical power engineering and power system planning, and post-graduates and students in advanced graduate-level courses.

Theoretical Advances and Applications of Fuzzy Logic and Soft Computing Oscar Castillo 2007-06-08 This book comprises a selection of papers on theoretical advances and applications of fuzzy logic and soft computing from the IFSA 2007 World Congress, held in Cancun, Mexico, June 2007. These papers constitute an important contribution to the theory and applications of fuzzy logic and soft computing methodologies.

FUZZY DECISION MAKING TOOLS TO SIEVE OUT THE POOR IN NALANDA DISTRICT, BIHAR Raj Kumar 2021-03-31 The author is glad to present to the readers, the book titled “Fuzzy Decision Making Tools to Sieve out the Poor in Nalanda District, Bihar”. The book is all about ‘how to identify and how to aggregate the poor’ in any given socio-economic context or condition, using the concept of Fuzzy Logic and Fuzzy Sets. This book will serve research students in applied mathematics and it will also be helpful to those who are involved in making socio-economic decision to distribute the resources available at their disposal. Why and How this book came into Being Decision making over the issue of ‘how to measure poverty’ has always been the subject of contentious debate for an economist, for a government, for a statistician, for a mathematician, or for any socio-economic plan. Several Decision Methods have been adopted to decide who would be considered poor or who would not. For examples: (i) Absolute and Relative Poverty Line Method, (ii) Uni- dimension poverty Method (iii) Income-Expenditure Method (iv) Head Count Ratio (HCR), (v) Income Gap Ratio (IGR) (vi) Poverty Gap Ratio (PGR), (vii) Advance Measure Method: – Foster-Greer-Thorbecke Measure, Sen – Shorrocks – Thon measure (SST), and Sen Index (viii) Multi-dimensional Poverty Approach :- (i) Counting Multi-dimensional Poverty (ii) Multi-dimensional Poverty Index (MPI) , and (iii) Capability Approach. These above mentioned methods were used at the global level. Identification of poor and non-poor in India is done based on Uni-dimensional model that is to say Income-consumption and expenditure model using following experts committee reports: (i) Dandekar and Rath (ii) Y.K. Alagh (iii) Lakdawala (iii) Suresh Tendulkar Committee (iv) C. Rangarajan Committee:- Modified Mixed Reference Period (MMRP), Poverty Line Basket (PLB), and Socio-Economic and Caste Census (SECC) 2011: BPL Identification in 2015. Nevertheless, every state in India is free to set its own standard of method to scale out the poor. The state of Bihar adopted the method of A Score Based Ranking Methodology to identify the poor. In Mathematical Modelling context all the above mentioned methods of making decisions fall under Crisp Decision Approach based on Aristotelian logic and Crisp Sets. In response to this method of decision making approach, fuzzy decision making approach was suggested as a better alternative to the process of poverty measurement method. Andrea Cerioli and Sergio Zani were the first one to apply fuzzy logic to poverty assessment in the year 1990. Later, Chiappero Martinetti and Qizilbash added the intrinsic vagueness of being poor by using so – called membership function for the identification of the poor. As the research continued further some more methods were addressed such as Totally Fuzzy (TF), Totally Fuzzy and Relative (TFR), Integrated Fuzzy Approach (Multidimensional and Longitudinal) to apply to identify and aggregate the poor. Key Concepts and Techniques This book further develops and introduces a new approach suggesting Multi-Criteria Fuzzy Decision-making Tools and Fuzzy Set Theory to capture the extent of poverty of households accommodating both the quantitative and qualitative factors such as Roti (Food), Kapda (Clothing), Makaan (Housing), Kaam (Job), and Samman (Social Status) and their fourteen respective sub-criteria. The fuzzification process is carried out by using Pentagonal Fuzzy Numbers (PFNs) and by introducing Stratified Fuzzy Analytical Hierarchy Process (SFAHP). Fuzzy poverty categorization is carried out by introducing Fuzzy Sieve Technique (FST). The judgment and scaling of the criteria and sub-criteria are done by adopting participative decision making method (interview method based on questionnaires). Stratified Fuzzy Analytical Hierarchy Process (SFAHP) categorizes the group of the poor into five subgroups such as (i) very poor, (ii) almost very poor (iii) poor, (iv) rather poor and (v) non-poor. Our fuzzy tools and methods are applied to the case study in Nalanda District, Bihar, India. The book also highlights the comparative studies between three models such as Analytical Hierarchy Process (AHP), Fuzzy Analytical Hierarchy Process (FAHP) and Stratified Fuzzy Analytical Hierarchy Process (SFAHP). The final results justify that Stratified Fuzzy Analytical Hierarchy Process (SFAHP) gives better results in

identifying the Poverty Status. Special Features Computer Algorithmic approach via MATLAB: (Programme for 5 X 5 Matrix) is given to calculate the fuzzy centre value by using Matlab m-file which will minimize the time in carrying out the fuzzification and normalization process to measure poverty status. At the end the author shall ever be grateful to the inquisitive researchers and socio-economic planners for their valuable suggestions for further improvement of this book. DR. RAJ KUMAR St. Xavier's College of Management and Technology, Patna Digha Ashiyan Road -11. Affliated to AKU, Patna, Bihar, India

Mining Intelligence and Knowledge Exploration Rajendra Prasath 2017-04-25 This book constitutes the refereed proceedings of the 4th International Conference on Mining Intelligence and Knowledge Exploration, MIKE 2016, held in Mexico City, Mexico, in November 2016. The 18 full papers presented were carefully reviewed and selected from 56 submissions. Accepted papers were grouped into various subtopics including information retrieval, machine learning, pattern recognition, knowledge discovery, classification, clustering, image processing, network security, speech processing, natural language processing, language, cognition and computation, fuzzy sets, and business intelligence.

Recent Advances in Applications of Computational and Fuzzy Mathematics Snehashish Chakraverty 2018-07-17 This book addresses the basics of interval/fuzzy set theory, artificial neural networks (ANN) and computational methods. It presents step-by-step modeling for application problems along with simulation and numerical solutions. In general, every science and engineering problem is inherently biased by uncertainty, and there is often a need to model, solve and interpret problems in the world of uncertainty. At the same time, exact information about models and parameters of practical applications is usually not known and precise values do not exist. This book discusses uncertainty in both data and models. It consists of seven chapters covering various aspects of fuzzy uncertainty in application problems, such as shallow water wave equations, static structural problems, robotics, radon diffusion in soil, risk of invasive alien species and air quality quantification. These problems are handled by means of advanced computational and fuzzy theory along with machine intelligence when the uncertainties involved are fuzzy. The proposed computational methods offer new fuzzy computing methods that help other areas of knowledge construction where inexact information is present.

A Novel Neutrosophic Data Analytic Hierarchy Process for Multi-Criteria Decision Making Method: A Case Study in Kuala Lumpur Stock Exchange Desmond Jun Yi Tey This paper proposes a multi-criteria decision making method called the neutrosophic data analytical hierarchy process (NDAHP) for the single-valued neutrosophic set (SVNS). This method is an extension of the neutrosophic analytic hierarchy process (NAHP) but was designed to handle actual datasets which consists of crisp values. Our proposed NDAHP method uses an objective weighting mechanism whereas all other existing versions of the AHP, fuzzy AHP and other fuzzy based AHP method in literature such as the NAHP and picture fuzzy AHP uses a subjective weighting mechanism to arrive at the decision. This makes our proposed NDAHP method a very objective one as the weightage of the criteria which forms the input of the evaluation matrix are determined in an objective manner using actual data collected for the problem, and hence will not change according to the opinions of the different decision makers which are subjective. The proposed NDAHP method is applied to a multi-criteria decision making problem related to the ranking of the financial performance of five public listed petrochemical companies trading in the main board of the Kuala Lumpur Stock Exchange (KLSE). Actual dataset of 15 financial indices for the five petrochemical companies for 2017 obtained from Yahoo! Finance were used in this study. Following this, a brief comparative study is conducted to evaluate the performance of our NDAHP algorithm against the results of other existing SVNS based decision making methods in literature. The results are compared against actual results obtained from KLSE. To further verify the rankings obtained through each method, the Spearman and Pearson ranking tests are carried out on each of the decision making methods that are studied. It is proved that our proposed NDAHP method produces the most accurate results, and this was further verified from the results of the Spearman and Pearson ranking tests.

Fundamentals of the Fuzzy Logic-Based Generalized Theory of Decisions Rafik Aziz Aliev 2013-01-12 Every day decision making and decision making in complex human-centric systems are characterized by imperfect decision-relevant information. Main drawback of the existing decision theories is namely incapability to deal with imperfect information and modeling vague preferences. Actually, a paradigm of non-numerical probabilities in decision making has a long history and arose also in Keynes's analysis of uncertainty. There is a need for further generalization – a move to decision theories with perception-based imperfect information described in NL. The languages of new decision models for human-centric systems should be not languages based on binary logic but human-centric computational schemes able to operate on NL-described information. Development of new theories is now possible due to an increased computational power of information processing systems which allows for computations with imperfect information, particularly, imprecise and partially true information, which are much more complex than computations over numbers and probabilities. The monograph exposes the foundations of a new decision theory with imperfect decision-relevant information on environment and a decision maker's behavior. This theory is based on the synthesis of the fuzzy sets theory with perception-based information and the probability theory. The book is self containing and represents in a systematic way the decision theory with imperfect information into the educational systems. The book will be helpful for teachers and students of universities and colleges, for managers and specialists from various fields of business and economics, production and social sphere.

A Handbook on Multi-Attribute Decision-Making Methods Omid Bozorg-Haddad 2021-04-06 Clear and effective instruction on MADM methods for students, researchers, and practitioners. A Handbook on Multi-Attribute Decision-Making Methods describes multi-attribute decision-making (MADM) methods and provides step-by-step guidelines for applying them. The authors describe the most important MADM methods and provide an assessment of their performance in solving problems across disciplines. After offering an overview of decision-making and its fundamental concepts, this book covers 20 leading MADM methods and contains an appendix on weight assignment methods. Chapters are arranged with optimal learning in mind, so you can easily engage with the content found in each chapter. Dedicated readers may go through the

entire book to gain a deep understanding of MADM methods and their theoretical foundation, and others may choose to review only specific chapters. Each standalone chapter contains a brief description of prerequisite materials, methods, and mathematical concepts needed to cover its content, so you will not face any difficulty understanding single chapters. Each chapter: Describes, step-by-step, a specific MADM method, or in some cases a family of methods Contains a thorough literature review for each MADM method, supported with numerous examples of the method's implementation in various fields Provides a detailed yet concise description of each method's theoretical foundation Maps each method's philosophical basis to its corresponding mathematical framework Demonstrates how to implement each MADM method to real-world problems in a variety of disciplines In MADM methods, stakeholders' objectives are expressible through a set of often conflicting criteria, making this family of decision-making approaches relevant to a wide range of situations. A Handbook on Multi-Attribute Decision-Making Methods compiles and explains the most important methodologies in a clear and systematic manner, perfect for students and professionals whose work involves operations research and decision making.

11th International Conference on Theory and Application of Soft Computing, Computing with Words and Perceptions and Artificial Intelligence - ICSCCW-2021 Rafik A. Aliev 2022 This book presents the proceedings of the 11th Conference on Theory and Applications of Soft Computing, Computing with Words and Perceptions and Artificial Intelligence, ICSCCW-2021, held in Antalya, Turkey, on August 23-24, 2021. The general scope of the book covers uncertain computation, decision making under imperfect information, neuro-fuzzy approaches, natural language processing, and other areas. The topics of the papers include theory and application of soft computing, computing with words, image processing with soft computing, intelligent control, machine learning, fuzzy logic in data mining, soft computing in business, economics, engineering, material sciences, biomedical engineering, and health care. This book is a useful guide for academics, practitioners, and graduates in fields of soft computing and computing with words. It allows for increasing of interest in development and applying of these paradigms in various real-life fields.

Handbook of Neural Computation Pijush Samui 2017-07-18 Handbook of Neural Computation explores neural computation applications, ranging from conventional fields of mechanical and civil engineering, to electronics, electrical engineering and computer science. This book covers the numerous applications of artificial and deep neural networks and their uses in learning machines, including image and speech recognition, natural language processing and risk analysis. Edited by renowned authorities in this field, this work is comprised of articles from reputable industry and academic scholars and experts from around the world. Each contributor presents a specific research issue with its recent and future trends. As the demand rises in the engineering and medical industries for neural networks and other machine learning methods to solve different types of operations, such as data prediction, classification of images, analysis of big data, and intelligent decision-making, this book provides readers with the latest, cutting-edge research in one comprehensive text. Features high-quality research articles on multivariate adaptive regression splines, the minimax probability machine, and more Discusses machine learning techniques, including classification, clustering, regression, web mining, information retrieval and natural language processing Covers supervised, unsupervised, reinforced, ensemble, and nature-inspired learning methods

Advances in Computational Intelligence, Part IV Salvatore Greco 2012-07-23 These four volumes (CCIS 297, 298, 299, 300) constitute the proceedings of the 14th International Conference on Information Processing and Management of Uncertainty in Knowledge-Based Systems, IPMU 2012, held in Catania, Italy, in July 2012. The 258 revised full papers presented together with six invited talks were carefully reviewed and selected from numerous submissions. The papers are organized in topical sections on fuzzy machine learning and on-line modeling; computing with words and decision making; soft computing in computer vision; rough sets and complex data analysis: theory and applications; intelligent databases and information system; information fusion systems; philosophical and methodological aspects of soft computing; basic issues in rough sets; 40th anniversary of the measures of fuziness; SPS11 uncertainty in profiling systems and applications; handling uncertainty with copulas; formal methods to deal with uncertainty of many-valued events; linguistic summarization and description of data; fuzzy implications: theory and applications; sensing and data mining for teaching and learning; theory and applications of intuitionistic fuzzy sets; approximate aspects of data mining and database analytics; fuzzy numbers and their applications; information processing and management of uncertainty in knowledge-based systems; aggregation functions; imprecise probabilities; probabilistic graphical models with imprecision: theory and applications; belief function theory: basics and/or applications; fuzzy uncertainty in economics and business; new trends in De Finetti's approach; fuzzy measures and integrals; multi criteria decision making; uncertainty in privacy and security; uncertainty in the spirit of Pietro Benvenuti; coopetition; game theory; probabilistic approach.

On urban water pricing with practical application of fuzzy logic model and analytic hierarchy process in Shanghai Mao Weide 2005

Application of Geographical Information Systems and Soft Computation Techniques in Water and Water Based Renewable Energy Problems Mrinmoy Majumder 2017-09-18 This book highlights the application of Geographical Information System (GIS) and nature based algorithms to solve the problems of water and water based renewable energy resources. The irregularity in availability of resources and inefficiency in utilization of the available resources has reduced the potentiality of water and water based renewable energy resources. In recent years various soft computation methods (SCM) along with GIS were adopted to solve critical problems. The book collects various studies where many SCMs were used along with GIS to provide a solution for optimal utilization of natural resources for satisfying the basic needs of the population as well as fulfilling their burgeoning energy demands. The articles depict innovative application of soft computation techniques to identify the root cause and to mitigate the uncertainty for optimal utilization of the available water resources. The advantage of SCM and GIS were used to maximize the utilization of water resources under cost and

time constraints in face of climatic abnormalities and effect of rapid urbanization.
Applications and Theory of Analytic Hierarchy Process Fabio De Felice 2016-08-31 The purpose of this book is to provide an introduction to the theory and applications in the field of decision making, especially focused on Analytic Hierarchy Process, a structured technique for organizing and analyzing complex decisions, based on mathematics and psychology. It was developed by Prof. Thomas L. Saaty in the 1970s and has been extensively studied and refined since then. The idea of the book is to expand the reader's consciousness to deal with problems regarding the decision making. This book presents some application examples of Analytic Hierarchy. It contains original research and application chapters from different perspectives, and covers different areas such as supply chain, environmental engineering, safety, and social issues. This book is intended to be a useful resource for anyone who deals with decision making problems.
Fifth recent advances in quantitative remote sensing José Antonio Sobrino Rodríguez 2018-12-14 The Fifth International Symposium on Recent Advances in Quantitative Remote Sensing was held in Torrent, Spain from 18 to 22 September 2018. It was sponsored and organized by the Global Change Unit (GCU) from the Image Processing Laboratory (IPL), University of Valencia (UVEG), Spain. This Symposium addressed the scientific advances in quantitative remote sensing in connection with real applications. Its main goal was to assess the state of the art of both theory and applications in the analysis of remote sensing data, as well as to provide a forum for researcher in this subject area to exchange views and report their latest results. In this book 89 of the 262 contributions presented in both plenary and poster sessions are arranged according to the scientific topics selected. The papers are ranked in the same order as the final programme.
Mathematics—Advances in Research and Application: 2012 Edition 2012-12-26 Mathematics—Advances in Research and Application: 2012 Edition is a ScholarlyEditions™ eBook that delivers timely, authoritative, and comprehensive information about Mathematics. The editors have built Mathematics—Advances in Research and Application: 2012 Edition on the vast information databases of ScholarlyNews.™ You can expect the information about Mathematics in this eBook to be deeper than what you can access anywhere else, as well as consistently reliable, authoritative, informed, and relevant. The content of Mathematics—Advances in Research and Application: 2012 Edition has been produced by the world’s leading scientists, engineers, analysts, research institutions, and companies. All of the content is from peer-reviewed sources, and all of it is written, assembled, and edited by the editors at ScholarlyEditions™ and available exclusively from us. You now have a source you can cite with authority, confidence, and credibility. More information is available at http://www.ScholarlyEditions.com/.
Using Decision Support Systems for Transportation Planning Efficiency Ocalir-Akunal, Ebru V. 2015-08-12 The integration of technology into the transport planning sector has allowed for more stable, yet increasingly complex models that enable better analysis techniques and new approaches to decision making. These modern advances ensure higher productivity in addressing various planning problems. Using Decision Support Systems for Transportation Planning Efficiency is a valuable reference source of the latest scholarly research on the vast improvements that computational innovations have made for transportation planners. Featuring extensive coverage on a range of topics relating to spatial planning, environmental risks of transport, and traffic information systems, this publication is a pivotal reference source for transportation planners, professionals, and academicians seeking expert information on a multitude of transportation issues. This publication features timely chapters relevant to the area of transport planning, including artificial neural network models, logistics hubs, urban growth and expansion, accessibility modeling, sustainable mobility, hazardous materials transport, and urban intersections.
Fuzzy Analytic Hierarchy Process Ali Emrouznejad 2017-09-18 This book is the first in the literature to present the state of the art and some interesting and relevant applications of the Fuzzy Analytic Hierarchy Process (FAHP). The AHP is a conceptually and mathematically simple, easily implementable, yet extremely powerful tool for group decision making and is used around the world in a wide variety of decision situations, in fields such as government, business, industry, healthcare, and education. The aim of this book is to study various fuzzy methods for dealing with the imprecise and ambiguous data in AHP. Features: First book available on FAHP. Showcases state-of-the-art developments. Contains several novel real-life applications. Provides useful insights to both academics and practitioners in making group decisions under uncertainty This book provides the necessary background to work with existing fuzzy AHP models. Once the material in this book has been mastered, the reader will be able to apply fuzzy AHP models to his or her problems for making decisions with imprecise data.
Fuzzy Hierarchical Model for Risk Assessment Hing Kai Chan 2013-04-11 Risk management is often complicated by situational uncertainties and the subjective preferences of decision makers. Fuzzy Hierarchical Model for Risk Assessment introduces a fuzzy-based hierarchical approach to solve risk management problems considering both qualitative and quantitative criteria to tackle imprecise information. This approach is illustrated through number of case studies using examples from the food, fashion and electronics sectors to cover a range of applications including supply chain management, green product design and green initiatives. These practical examples explore how this method can be adapted and fine tuned to fit other industries as well. Supported by an extensive literature review, Fuzzy Hierarchical Model for Risk Assessment comprehensively introduces a new method for project managers across all industries as well as researchers in risk management. this area.
Computational Intelligence in Oncology Khalid Raza
Theoretical and Practical Advancements for Fuzzy System Integration Li, Deng-Feng 2017-01-05 In real management situations, uncertainty is inherently present in decision making. As such, it is increasingly imperative to research and develop new theories and methods of fuzzy sets. Theoretical and Practical Advancements for Fuzzy System Integration is a pivotal reference source for the latest scholarly research on the importance of expressing and measuring fuzziness in order to develop effective and practical decision making models and methods. Featuring coverage on an expansive range

of perspectives and topics, such as fuzzy logic control, intuitionistic fuzzy set theory, and defuzzification, this book is ideally designed for academics, professionals, and researchers seeking current research on theoretical frameworks and real-world applications in the area of fuzzy sets and systems.

Medical Imaging: Concepts, Methodologies, Tools, and Applications Management Association, Information Resources 2016-07-18 Medical imaging has transformed the ways in which various conditions, injuries, and diseases are identified, monitored, and treated. As various types of digital visual representations continue to advance and improve, new opportunities for their use in medical practice will likewise evolve. Medical Imaging: Concepts, Methodologies, Tools, and Applications presents a compendium of research on digital imaging technologies in a variety of healthcare settings. This multi-volume work contains practical examples of implementation, emerging trends, case studies, and technological innovations essential for using imaging technologies for making medical decisions. This comprehensive publication is an essential resource for medical practitioners, digital imaging technologists, researchers, and medical students.

Applying Fuzzy Logic for the Digital Economy and Society Andreas Meier 2019-02-28 This edited book presents the state-of-the-art of applying fuzzy logic to managerial decision-making processes in areas such as fuzzy-based portfolio management, recommender systems, performance assessment and risk analysis, among others. Presenting the latest research, with a strong focus on applications and case studies, it is a valuable resource for researchers, practitioners, project leaders and managers wanting to apply or improve their fuzzy-based skills.

Fuzzy Logic Based in Optimization Methods and Control Systems and Its Applications Ali Sadollah 2018-10-31 Fuzzy logic models can be used to demonstrate human decision making in complex situations, and can therefore be an important tool in examining natural complexity. Moreover, fuzzy logic can be exploited to predict chaotic behaviors. But why is fuzzy logic so valuable? The idea of fuzzy logic has been around since 1965, and since its introduction thousands of applications of fuzzy logic have been implemented in industry, medicine, and even economic applications and patents. How did this invaluable theory achieve such great success? This book aims to compare well-known and well-used membership functions to demonstrate how to select the best membership functions and show when and why to utilize them. This book also demonstrates how different fields of studies utilize fuzzy logic showing its wide reach and relevance.

Fuzzy Logic, Soft Computing and Computational Intelligence 2005

Fuzzy Applications in Industrial Engineering Cengiz Kahraman 2007-05-31 After an introductory chapter explaining recent applications of fuzzy sets in IE, this book explores the seven major areas of IE to which fuzzy set theory can contribute: Control and Reliability, Engineering Economics and Investment Analysis, Group and Multi-criteria Decision-making, Human Factors Engineering and Ergonomics, Manufacturing Systems and Technology Management, Optimization Techniques, and Statistical Decision-making. Under these major areas, every chapter includes didactic numerical applications.

Fuzzy Multi-Criteria Decision Making Cengiz Kahraman 2008-08-09 This work examines all the fuzzy multicriteria methods recently developed, such as fuzzy AHP, fuzzy TOPSIS, interactive fuzzy multiobjective stochastic linear programming, fuzzy multiobjective dynamic programming, grey fuzzy multiobjective optimization, fuzzy multiobjective geometric programming, and more. Each of the 22 chapters includes practical applications along with new developments/results. This book may be used as a textbook in graduate operations research, industrial engineering, and economics courses. It will also be an excellent resource, providing new suggestions and directions for further research, for computer programmers, mathematicians, and scientists in a variety of disciplines where multicriteria decision making is needed.

Fuzzy Sets, Fuzzy Logic and Their Applications Michael Gr. Voskoglou 2020-03-25 The present book contains 20 articles collected from amongst the 53 total submitted manuscripts for the Special Issue “Fuzzy Sets, Fuzzy Loigic and Their Applications” of the MDPI journal Mathematics. The articles, which appear in the book in the series in which they were accepted, published in Volumes 7 (2019) and 8 (2020) of the journal, cover a wide range of topics connected to the theory and applications of fuzzy systems and their extensions and generalizations. This range includes, among others, management of the uncertainty in a fuzzy environment; fuzzy assessment methods of human-machine performance; fuzzy graphs; fuzzy topological and convergence spaces; bipolar fuzzy relations; type-2 fuzzy; and intuitionistic, interval-valued, complex, picture, and Pythagorean fuzzy sets, soft sets and algebras, etc. The applications presented are oriented to finance, fuzzy analytic hierarchy, green supply chain industries, smart health practice, and hotel selection. This wide range of topics makes the book interesting for all those working in the wider area of Fuzzy sets and systems and of fuzzy logic and for those who have the proper mathematical background who wish to become familiar with recent advances in fuzzy mathematics, which has entered to almost all sectors of human life and activity.

Advances in Fuzzy Logic and Technology 2017 Janusz Kacprzyk 2017-08-29 This volume constitutes the proceedings of two collocated international conferences: EUSFLAT-2017 – the 10th edition of the flagship Conference of the European Society for Fuzzy Logic and Technology held in Warsaw, Poland, on September 11–15, 2017, and IWIFSGN’2017 – The Sixteenth International Workshop on Intuitionistic Fuzzy Sets and Generalized Nets, held in Warsaw on September 13–15, 2017. The conferences were organized by the Systems Research Institute, Polish Academy of Sciences, Department IV of Engineering Sciences, Polish Academy of Sciences, and the Polish Operational and Systems Research Society in collaboration with the European Society for Fuzzy Logic and Technology (EUSFLAT), the Bulgarian Academy of Sciences and various European universities. The aim of the EUSFLAT-2017 was to bring together theoreticians and practitioners working on fuzzy logic, fuzzy systems, soft computing and related areas and to provide a platform for exchanging ideas and discussing the l atest trends and ideas, while the aim of IWIFSGN’2017 was to discuss new developments in extensions of the concept of a fuzzy set, such as an intuitionistic fuzzy set, as well as other concepts, like that of a generalized net. The papers included, written by leading international experts, as well as the special sessions

and panel discussions contribute to the development the field, strengthen collaborations and intensify networking.