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Mathematical Models for Decision Support - Harvey J. Greenberg 2012-12-06

It is quite an onerous task to edit the proceedings of a two week long institute with learned contributors from many parts of the world. All the same, the editorial team has found the process of refereeing and reviewing the contributions worthwhile and completing the volume has proven to be a satisfying task. In setting up the institute we had considered models and methods taken from a number of different disciplines. As a result the whole institute - preparing for it, attending it and editing the proceedings - proved to be an intense learning experience for us. Here I speak on behalf of the committee and the editorial team. By the time the institute took place, the papers were delivered and the delegates exchanged their views, the structure of the topics covered and their relative positioning appeared in a different light. In editing the volume I felt compelled to introduce a new structure in grouping the papers. The contents of this volume are organised in eight main sections set out below: 1 . Abstracts. 2. Review Paper. 3. Models with Multiple Criteria and Single or Multiple Decision Makers. 4. Use of Optimisation Models as Decision Support Tools. 5. Role of Information Systems in Decision Making: Database and Model Management Issues. 6. Methods of Artificial Intelligence in Decision Making: Intelligent Knowledge Based Systems. 7. Representation of Uncertainty in Mathematical Models and Knowledge Based Systems. 8. Mathematical Basis for Constructing Models and Model Validation.

Analytical Planning - Thomas L. Saaty 2014-05-17

Analytical Planning: The Organization of Systems deals with systems and planning and suggests a methodological tool for integrating the two. This book presents the basic ideas behind complexity, systems, hierarchies, and prioritization and describes planning as a unique form of decision making with illustrations of some prominent philosophical and methodological approaches. It highlights some shortcomings of traditional approaches to planning and shows how these can be addressed by the systems approach. This monograph consists of seven chapters and opens with a discussion on the nature of complexity and describes an approach that facilitates the use of creativity and experience to structure complex problems. The next chapter explains the rationale for systems thinking and how reductionism works. The Analytic Hierarchy Process is then considered, along with its relationship to some of the properties of systems. The remaining chapters focus on ways of thinking about planning and philosophies of planning; strategic planning; and the applicability of the Analytic Hierarchy Process to benefit-cost analysis and resource allocation. This book is intended for managers, decision makers, and planners, as well as researchers and practitioners in applied mathematics and computer science.

Multicriteria Decision Making - Thomas L. Saaty 1996-01-01

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

Decision Aids for Selection Problems - David L. Olson 2012-12-06

One of the most important tasks faced by decision-makers in business and government is that of selection. Selection problems are challenging in that they require the balancing of multiple, often conflicting, criteria. In recent years, a number of interesting decision aids have become available to assist in such decisions. The aim of this book is to provide a comparative survey of many of the decision aids currently available. The first chapters present general ideas which underpin the methodologies used to design these aids.

Subsequent chapters then focus on specific decision aids and demonstrate some of the software which implement these ideas. A final chapter provides a comparative analysis of their strengths and weaknesses. *Understanding the Analytic Hierarchy Process* - Konrad Kulakowski 2020-11-10

One of the best-known methods of multi-criteria decision-making is the Analytic Hierarchy Process (AHP). This method provides a convenient and versatile framework for modeling multi-criteria decision problems, evaluating alternatives, and deriving final priorities. Rather than imposing a "correct" decision, AHP allows the user to create a ranking of alternatives, then choose the one which is the best (or among the best). At the core of AHP is a pairwise comparisons (PC) method. This is an old technique known in various forms since at least the Middle Ages. AHP uses and develops the PC method. The aim of *Understanding the Analytic Hierarchy Process* is to provide the reader with a critical guide to AHP. In this book, the AHP method is considered primarily as a mathematical technique supporting the decision-making process. Key Features Collects the ideas underpinning the AHP method and discusses them together with many improvements and extensions present in the literature. As a result, the reader will receive a much more complete picture of the method. Aimed at theorists and advanced practitioners from a wide range of scientific fields, including the social, management, and technical sciences. Highlights the intuitive assumptions underlying the mathematical methods that make up AHP and the pairwise comparisons method. Provides software code for readers who wish to practice AHP analysis using the Wolfram Language.

Successful Case-based Reasoning Applications - Stefania Montani 2010-08-11

Case-based reasoning (CBR) is an Artificial Intelligence (AI) technique to support the capability of reasoning and learning in advanced decision support systems. CBR exploits the specific knowledge collected on previously encountered and solved situations, which are known as cases. In this book, we have collected a selection of papers on very recent CBR applications. These, after an in-depth analysis of their specific application domain needs, propose proper methodological solutions and give encouraging evaluation results, which have in some cases led to the commercialization step. The collected contributions demonstrate the capability of CBR to solve or handle issues which would be too difficult to manage with other classical AI methods and techniques, such as rules or models. The heterogeneity of the involved

application domains indicates the flexibility of CBR, and its applicability in all those fields where experiential knowledge is (readily) available.

Advancing Culture of Living with Landslides - Matjaz Mikos 2017-06-10

This volume contains peer-reviewed papers from the Fourth World Landslide Forum organized by the International Consortium on Landslides (ICL), the Global Promotion Committee of the International Programme on Landslides (IPL), University of Ljubljana (UL) and Geological Survey of Slovenia in Ljubljana, Slovenia from May 29 to June 2,. The complete collection of papers from the Forum is published in five full-color volumes. This second volume contains the following: • Two keynote lectures • Landslide Field Recognition and Identification: Remote Sensing Techniques, Field Techniques • Landslide Investigation: Field Investigations, Laboratory Testing • Landslide Modeling: Landslide Mechanics, Simulation Models • Landslide Hazard Risk Assessment and Prediction: Landslide Inventories and Susceptibility, Hazard Mapping Methods, Damage Potential Prof. Matjaž Mikoš is the Forum Chair of the Fourth World Landslide Forum. He is the Vice President of International Consortium on Landslides and President of the Slovenian National Platform for Disaster Risk Reduction. Prof. Binod Tiwari is the Coordinator of the Volume 2 of the Fourth World Landslide Forum. He is a Board member of the International Consortium on Landslides and an Executive Editor of the International Journal "Landslides". He is the Chair-Elect of the Engineering Division of the US Council of Undergraduate Research, Award Committee Chair of the American Society of Civil Engineering, Geo-Institute's Committee on Embankments, Slopes, and Dams Committee. Prof. Yueping Yin is the President of the International Consortium on Landslides and the Chairman of the Committee of Geo-Hazards Prevention of China, and the Chief Geologist of Geo-Hazard Emergency Technology, Ministry of Land and Resources, P.R. China. Prof. Kyoji Sassa is the Founding President of the International Consortium on Landslides (ICL). He is Executive Director of ICL and the Editor-in-Chief of International Journal "Landslides" since its foundation in 2004. IPL (International Programme on Landslides) is a programme of the ICL. The programme is managed by the IPL Global Promotion Committee including ICL and ICL supporting organizations, UNESCO, WMO, FAO, UNISDR, UNU, ICSU, WFEO, IUGS and IUGG. The IPL contributes to the United Nations International Strategy for Disaster Reduction and the ISDR-ICL Sendai Partnerships 2015-2025.

Practical Decision Making - Enrique Mu 2016-08-16

This book offers a simple introduction to the fundamentals and applications of the Analytic Hierarchy Process (AHP) without a pre-requisite for a sophisticated mathematical background. It provides a quick and intuitive understanding of the methodology using spreadsheet examples and explains in a step-by-step fashion how to use Super Decisions, a freely available software developed by the Creative Decisions Foundations. The book is intended to be a resource for decision makers with little or no exposure to the field of Operations Research (OR); however, the book can be used as a very gentle introduction to the AHP methodology and/or as an AHP hands-on supplement for standard OR textbooks. AHP is an intuitive and mathematically simple methodology in the field of multi-criteria decision making. Because of this, most AHP books assume the reader has basic OR mathematical background. However, AHP simplicity suggests that decision makers from all disciplines can take advantage of the methodology without struggling with the mathematics behind it. To fulfill this need, this book delivers a quick and practical understanding of the method that can be useful for corporate executives.

Recent Advances in Operations Management Applications - Anish Sachdeva 2022-02-28

This book presents the select proceedings of the International Conference on Industrial and Manufacturing Systems (CIMS 2020). It presents the current scenarios and future advancements in the domain of industrial engineering under context of optimum value. Various topics covered include optimisation and its applicability in the various areas of industrial engineering like selection of designing parameters and, decisions related to conditions of optimum process/operation parameters, facilities planning and management, transportation and supply chain management, quality engineering, reliability and maintenance, system optimization, product design and development, human factors and ergonomics, project management, service system and service management, waste management, sustainable manufacturing and operations, systems design, lean manufacturing, and performance measurement. This book will be useful for the students, researchers and professionals working in the area of industrial and

production engineering.

Hydro-Environmental Analysis - James L. Martin 2013-12-04

Focusing on fundamental principles, Hydro-Environmental Analysis: Freshwater Environments presents in-depth information about freshwater environments and how they are influenced by regulation. It provides a holistic approach, exploring the factors that impact water quality and quantity, and the regulations, policy and management methods that are necessary to maintain this vital resource. It offers a historical viewpoint as well as an overview and foundation of the physical, chemical, and biological characteristics affecting the management of freshwater environments. The book concentrates on broad and general concepts, providing an interdisciplinary foundation. The author covers the methods of measurement and classification; chemical, physical, and biological characteristics; indicators of ecological health; and management and restoration. He also considers common indicators of environmental health; characteristics and operations of regulatory control structures; applicable laws and regulations; and restoration methods. The text delves into rivers and streams in the first half and lakes and reservoirs in the second half. Each section centers on the characteristics of those systems and methods of classification, and then moves on to discuss the physical, chemical, and biological characteristics of each. In the section on lakes and reservoirs, it examines the characteristics and operations of regulatory structures, and presents the methods commonly used to assess the environmental health or integrity of these water bodies. It also introduces considerations for restoration, and presents two unique aquatic environments: wetlands and reservoir tailwaters. Written from an engineering perspective, the book is an ideal introduction to the aquatic and limnological sciences for students of environmental science, as well as students of environmental engineering. It also serves as a reference for engineers and scientists involved in the management, regulation, or restoration of freshwater environments.

Information Processing and Management of Uncertainty - Anne Laurent 2014-07-17

These three volumes (CCIS 442, 443, 444) constitute the proceedings of the 15th International Conference on Information Processing and Management of Uncertainty in Knowledge-Based Systems, IPMU 2014, held in Montpellier, France, July 15-19, 2014. The 180 revised full papers presented together with five invited talks were carefully reviewed and selected from numerous submissions. The papers are organized in topical sections on uncertainty and imprecision on the web of data; decision support and uncertainty management in agri-environment; fuzzy implications; clustering; fuzzy measures and integrals; non-classical logics; data analysis; real-world applications; aggregation; probabilistic networks; recommendation systems and social networks; fuzzy systems; fuzzy logic in boolean framework; management of uncertainty in social networks; from different to same, from imitation to analogy; soft computing and sensory analysis; database systems; fuzzy set theory; measurement and sensory information; aggregation; formal methods for vagueness and uncertainty in a many-valued realm; graduality; preferences; uncertainty management in machine learning; philosophy and history of soft computing; soft computing and sensory analysis; similarity analysis; fuzzy logic, formal concept analysis and rough set; intelligent databases and information systems; theory of evidence; aggregation functions; big data - the role of fuzzy methods; imprecise probabilities: from foundations to applications; multinomial logistic regression on Markov chains for crop rotation modelling; intelligent measurement and control for nonlinear systems.

Multi-criteria Decision Analysis - Alessio Ishizaka 2013-06-10

This book presents an introduction to MCDA followed by more detailed chapters about each of the leading methods used in this field. Comparison of methods and software is also featured to enable readers to choose the most appropriate method needed in their research. Worked examples as well as the software featured in the book are available on an accompanying website.

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.

Readings in Multiple Criteria Decision Aid - Carlos A. Bana e Costa 2012-12-06

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.

Application of Multi-Criteria Decision Analysis in Environmental and Civil Engineering - Dilber Uzun Ozsahin 2021-02-28

The use of a multi-criteria, decision-making theory was first studied in the 1970s. Its application in civil and environmental engineering is a new approach which can be enormously helpful for manufacturing companies, students, managers, engineers, etc. The purpose of this book is to provide a resource for students and researchers that includes current application of a multi-criteria, decision-making theory in various fields such as: environment, healthcare and engineering. In addition, practical application are shown for students manually. In real life problems there are many critical parameters (criteria) that can directly or indirectly affect the consequences of different decisions. Application of a multi-criteria, decision-making theory is basically the use of computational methods that incorporate several criteria and order of preference in evaluating and selecting the best option among many alternatives based on the desired outcome.

The Analytic Hierarchy Process (AHP) in Software Development (Digital Short Cut) - Bijay K. Jayaswal 2007-03-01

This is the eBook version of the printed book. The Analytic Hierarchy Process (AHP) is an advanced technique that supports decision makers in structuring complex decisions, quantifying intangible factors, and evaluating choices in multiobjective decision situations. It is a comprehensive and rational decision-making framework that provides a powerful methodology for determining relative worth among a set of elements. AHP is especially suitable for complex decisions that involve the comparison of decision elements which are difficult to quantify. The AHP, and its more recent version the Analytic Network Process (ANP), were developed by Dr. Thomas Saaty and have been applied in a wide variety of decision situations in organizations worldwide. AHP is particularly applicable in managing software complexity, and in Quality Function Deployment (QFD), as presented in Chapter 11 of the book *Design for Trustworthy Software*. This short cut illustrates the application of AHP in prioritizing complex design issues. It also shows how AHP and its supporting software, Expert Choice (EC), can handle much higher levels of complexities accurately and expeditiously than the prioritization matrices introduced in Chapter 7 of *Design for Trustworthy Software*. In addition to solutions facilitated by EC, this short cut also illustrates two known approximations to AHP solutions using manual calculations. Manual calculations can be used to solve relatively less complex problems. They are presented in this short cut to illustrate the first principles and the steps involved in AHP. This short cut is a reproduction of Chapter 8 of the book *Design for Trustworthy Software* and introduces AHP with a simple example. It can be used either as a methodology in trustworthy software design process or as a standalone introductory presentation on AHP. This short cut should be of interest to software and quality professionals. In particular, it would be of value to the CMMI, Six Sigma, and DFSS communities worldwide, especially those who have acquired or plan to acquire Green Belt, Black Belt, Master Black Belt, or similar competencies in various quality management disciplines. It should also be a

useful resource for students and academicians of various programs at senior undergraduate and graduate levels, and for those preparing for ASQ's Certified Software Quality Engineer (CSQE) examination. What This Short Cut Covers 3 Introduction 4 Prioritization, Complexity, and the Analytic Hierarchy Process 4 Multiobjective Decision-Making and AHP 5 Case Study 1 Solution Using Expert Choice 12 Approximations to AHP with Manual Calculations 22 Conclusion 33 Key Points 33 Additional Resources 34 Internet Exercises 34 Review Questions 34 Discussion Questions and Projects 35 Problems 36 Endnotes 45 What's in the Book Design for Trustworthy Software 47 About the Authors 52 The Design for Trustworthy Software Digital Short Cut Compilation 53

The Analytic Hierarchy Process - Bruce L. Golden 2012-12-06

Management science is a discipline dedicated to the development of techniques that enable decision makers to cope with the increasing complexity of our world. The early burst of excitement which was spawned by the development and successful applications of linear programming to problems in both the public and private sectors has challenged researchers to develop even more sophisticated methods to deal with the complex nature of decision making. Sophistication, however, does not always translate into more complex mathematics. Professor Thomas L. Saaty was working for the U. S. Defense Department and for the U. S. Department of State in the late 1960s and early 1970s. In these positions, Professor Saaty was exposed to some of the most complex decisions facing the world: arms control, the Middle East problem, and the development of a transport system for a Third World country. While having made major contributions to numerous areas of mathematics and the theory of operations research, he soon realized that one did not need complex mathematics to come to grips with these decision problems, just the right mathematics! Thus, Professor Saaty set out to develop a mathematically-based technique for analyzing complex situations which was sophisticated in its simplicity. This technique became known as the Analytic Hierarchy Process (AHP) and has become very successful in helping decision makers to structure and analyze a wide range of problems.

Analytical Decision-Making Methods for Evaluating Sustainable Transport in European Corridors - Isabella M. Lami 2014-07-26

Eurocorridors are characterized by intensive transport flows and dynamic patterns of establishment and household locations. They are also considered the backbones of powerful spatial and economic forces in the areas that connect urban regions. One of the main difficulties in the spatial planning of eurocorridors has been the need to engage in different types of collective action. Such an approach can be extremely challenging in practice, useful to researchers in the field and to professionals as well. In the light of this, the book's main objectives are: - To define the problem by analyzing the key features, which include freight and passenger transport policies and issues; the territorial context, with its geographical, social, economic and cultural aspects; the plurality of subjects with different aims and resources and the lack of homogeneous information. - To illustrate assessment models and evaluation frameworks (MCDA; Discrete Choice Analysis; Collaborative Assessments; Geovisualization Technologies) in theoretical terms and by the use of case studies.

Models, Methods, Concepts & Applications of the Analytic Hierarchy Process - Thomas L. Saaty 2012-04-12

This fully revised and updated second edition includes five new chapters addressing the nature of the eigenvector and its applications, including selected uses of the analytic hierarchy process in economic, social, political, and technological areas.

Progress in Geospatial Analysis - Yuji Murayama 2012-07-06

This book examines current trends and developments in the methods and applications of geospatial analysis and highlights future development prospects. It provides a comprehensive discussion of remote sensing- and geographical information system (GIS)-based data processing techniques, current practices, theories, models, and applications of geospatial analysis. Data acquisition and processing techniques such as remote sensing image selections, classifications, accuracy assessments, models of GIS data, and spatial modeling processes are the focus of the first part of the book. In the second part, theories and methods related to fuzzy sets, spatial weights and prominence, geographically weighted regression, weight of evidence, Markov-cellular automata, artificial neural network, agent-based simulation, multi-criteria evaluation, analytic hierarchy process, and a GIS network model are included. Part three presents selected best

practices in geospatial analysis. The chapters, all by expert authors, are arranged so that readers who are new to the field will gain an overview and important insights. Those readers who are already practitioners will gain from the advanced and updated materials and state-of-the-art developments in geospatial analysis. *Decision Support Systems in Agriculture, Food and the Environment: Trends, Applications and Advances* - Manos, Basil 2010-06-30

As national and international concern over sustainable resources becomes more prevalent, the need for decision support systems (DSS) increases. The applicable uses of a successful system can assist in the sustainability of resources, as well as the efficiency and management of the agri-environment industry. *Decision Support Systems in Agriculture, Food and the Environment: Trends, Applications and Advances* presents the development of DSS for managing agricultural and environmental systems, focusing on the exposition of innovative methodologies, from web-mobile systems to artificial intelligence and knowledge-based DSS, as well as their applications in every aspect from harvest planning to international food production and land management. This book provides an in depth look into the growing importance of DSS in agriculture.

Models, Methods, Concepts & Applications of the Analytic Hierarchy Process - Thomas L. Saaty 2012-04-11

The Analytic Hierarchy Process (AHP) is a prominent and powerful tool for making decisions in situations involving multiple objectives. *Models, Methods, Concepts and Applications of the Analytic Hierarchy Process*, 2nd Edition applies the AHP in order to solve problems focused on the following three themes: economics, the social sciences, and the linking of measurement with human values. For economists, the AHP offers a substantially different approach to dealing with economic problems through ratio scales. Psychologists and political scientists can use the methodology to quantify and derive measurements for intangibles. Meanwhile researchers in the physical and engineering sciences can apply the AHP methods to help resolve the conflicts between hard measurement data and human values. Throughout the book, each of these topics is explored utilizing real life models and examples, relevant to problems in today's society. This new edition has been updated and includes five new chapters that includes discussions of the following: - The eigenvector and why it is necessary - A summary of ongoing research in the Middle East that brings together Israeli and Palestinian scholars to develop concessions from both parties - A look at the Medicare Crisis and how AHP can be used to understand the problems and help develop ideas to solve them.

Introduction to the Analytic Hierarchy Process - Matteo Brunelli 2014-12-12

The Analytic Hierarchy Process (AHP) has been one of the foremost mathematical methods for decision making with multiple criteria and has been widely studied in the operations research literature as well as applied to solve countless real-world problems. This book is meant to introduce and strengthen the readers' knowledge of the AHP, no matter how familiar they may be with the topic. This book provides a concise, yet self-contained, introduction to the AHP that uses a novel and more pedagogical approach. It begins with an introduction to the principles of the AHP, covering the critical points of the method, as well as some of its applications. Next, the book explores further aspects of the method, including the derivation of the priority vector, the estimation of inconsistency, and the use of AHP for group decisions. Each of these is introduced by relaxing initial assumptions. Furthermore, this booklet covers extensions of AHP, which are typically neglected in elementary expositions of the methods. Such extensions concern different numerical representations of preferences and the interval and fuzzy representations of preferences to account for uncertainty. During the whole exposition, an eye is kept on the most recent developments of the method.

Process-based Strategic Planning - Rudolf Grünig 2013-04-17

Developing a company's future strategy is an important and complex task and is the core issue in this book. After a short introduction to strategic planning a heuristic process for determining future strategies is presented. This process is divided into seven steps and for each of these steps detailed recommendations for problem-solving are provided and illustrated through many concrete examples.

The Logic of Priorities - Thomas L. Saaty 2013-11-11

This book presents applications of the Analytic Hierarchy Process developed by Thomas L. Saaty to deal with unstructured decision problems, together with case histories developed by him and in collaboration with others in areas of current societal concern. Its purpose is to provide the reader with examples of how

to deal with unstructured problems, particularly ones involving socio economic and political issues with qualitative and intangible factors. These examples show how to use judgment and experience to analyze a complex decision problem by combining its qualitative and quantitative aspects in a single framework and generating a set of priorities for alternative courses of action. The process has inherent flexibilities in structuring a problem and in taking diverse judgments from people, whether singly, in a group working together, or by questionnaire. Decisionmakers will profit from this approach. It makes accessible to them a framework for understanding the complexity of the system they are in as it impinges on the surrounding environment. To deal with complexity, we must first understand it. Systems thinking is necessary if all the important factors are to be considered. Complex systems problems can challenge and tax our logical capability to fully understand their causes and the consequences of any action we may take to solve them. Nevertheless, in time their effects on us tend to become better known than their causes.

Geoinformatics for Sustainable Development in Asian Cities - Sathaporn Monprapussorn 2019-11-16

This proceedings volume focuses on the importance and power of spatial thinking and planning, especially by applying geospatial technologies in solving the past and current global problems such as environmental degradation, urban pollution, climate change, agricultural management and epidemiology. The proceedings of the International Conference on Geography and Geoinformatics for Sustainable Development 2018 (ICGGS 2018) consist of a wide range of case studies from developing countries. The contributions address challenges of developing countries in mainstreaming sustainable development paradigm into their economy with the aim to improve and manage natural resources and environment in a sustainable manner. One of the main goals of the conference and the proceedings is to share and exchange different perspectives on global, regional and local spatial issues and how the concept of spatial planning and thinking can be used in building resilience to natural and anthropogenic threats in many sectors (such as water, ecosystem, agriculture and health). This includes a summary of how the key concepts of geospatial technologies could contribute to environmental sustainability and the Sustainable Development Goals (SDGs) as well as an outlook on challenges and opportunities for sustainable development. This book explains how geoinformatics can help analyse, model and explain sustainable development within a geographic context and thus provide the integrative framework necessary for global collaboration consensus and evidence-based decision-making. It highlights the vital and integrative role of geospatial information in driving sustainable development and thus can be used as a tool to put the 2030 Agenda for Sustainable Development into practice. This volume can be a useful resource for readers regarding research on geospatial issues on both the regional and local scale. Both undergraduate and graduate students around the globe can advance their academic and research knowledge of past and present environmental problems and learn how geospatial planning can be applied for sustainable development. It also appeals to researchers, academics, practitioners, community developers and policy makers interested in promoting sustainable development.

Proceedings of the 1985 Academy of Marketing Science (AMS) Annual Conference - Naresh K. Malhotra 2015-05-05

This volume includes the full proceedings from the 1985 Academy of Marketing Science (AMS) Annual Conference held in Miami Beach, Florida. It provides a variety of quality research in the fields of marketing theory and practice in areas such as consumer behaviour, marketing management, marketing education and international marketing, among others. Founded in 1971, the Academy of Marketing Science is an international organization dedicated to promoting timely explorations of phenomena related to the science of marketing in theory, research, and practice. Among its services to members and the community at large, the Academy offers conferences, congresses and symposia that attract delegates from around the world. Presentations from these events are published in this Proceedings series, which offers a comprehensive archive of volumes reflecting the evolution of the field. Volumes deliver cutting-edge research and insights, complimenting the Academy's flagship journals, the Journal of the Academy of Marketing Science (JAMS) and AMS Review. Volumes are edited by leading scholars and practitioners across a wide range of subject areas in marketing science.

Decision Making for Leaders - Thomas L. Saaty 1990

Executives in business, industry, & government can find out how to fine tune the decision making process

by using the highly acclaimed multicriteria decision making method of the Analytic Hierarchy Process (AHP). Put your decision making on a basis of logic & consistency. The AHP technique helps you organize your thought processes in a logical fashion & set priorities. This method is particularly applicable to decision making involving complex & ill- or non-structured problems with both tangible & intangible factors. You can predict likely outcomes, select the best alternatives, allocate resources according to priorities, conduct cost-benefit comparisons, plan projected or desired futures & exercise control over changes in the decision making system. This is a book of case studies & practical examples with an introduction to the theory. It can serve as a useful textbook in a decision making course in a graduate school of business.

Strategic Decision Making - Navneet Bhushan 2007-05-28

Strategic Decision Making provides an effective, formal methodology that provides help with decision making problems, especially strategic ones with high stakes involving human perceptions and judgements. Focusing on applying the AHP to decision-making problems, Strategic Decision Making covers problems in the realms of business, defence and governance. Using case studies drawn from years of experience, the book discusses decision making for real life problems and includes many worked examples and solutions to problems throughout. The reader will gain comprehensive exposure to the extent of assistance that a formal methodology, such as AHP, can provide to the decision maker in evolving decisions in complex and varied domains.

Assessment Framework for Urban Water Security - Hassan Tolba Aboelnga 2021-01-01

Urban water security is crucial for achieving sustainable development, peace, and human health and well-being. Framing urban water security is challenging due to the complexity and uncertainty of its definition and assessment framework. Several studies have assessed water security in widely divergent ways by granting priority indicators equal weight without considering or adapting to local conditions. This dissertation develops a new urban water security definition and assessment framework applicable to water scarce cities, with a focus on Madaba, Jordan. It takes a novel and systematic approach to assessing urban water security and culminates in integrated urban water security index (IUWSI) as a diagnostic tool and guide management actions. The dissertation suggests a new working definition of urban water security based on the United Nations (UN) Sustainable Development Goal 6.1 on safe drinking water for all and the human rights on water and sanitation as follows: The dynamic capacity of water systems and stakeholders to safeguard sustainable and equitable access to water of adequate quantity and acceptable quality that is continuously, physically and legally available at an affordable cost for sustaining livelihoods, human well-being and socioeconomic development, ensuring protection against waterborne pollution and water-related disasters, and for preserving ecosystems in a climate of peace and political stability. This proposed definition captures issues at the urban level of technical, environmental and socioeconomic indicators that emphasize credibility, legitimacy and salience. The assessment framework establishes a criteria hierarchy, consisting of four main dimensions to achieve urban water security: drinking water and human well-being, ecosystem, climate change and water-related hazards and socioeconomic aspects (together, DECS). The framework enables the analysis of relationships and trade-offs between urbanization, water security and DECS indicators. The dissertation also provides a structured analysis to understand how urban water is managed in intermittent water supply system, by conducting a water balance analysis after quantifying the components of water losses in Madaba's water distribution network. The findings showed that Madaba's non-revenue water (NRW) amounted to annual loss of about 3.5 million m³, corresponding to financial losses of 2.8 million USD to the utility, of which 1.7 million USD is the cost of real losses. The dissertation provided an intervention strategy for strengthening infrastructure resilience and reducing leakage via the infrastructure, repair, economic, awareness and pressure (IREAP) framework. The IREAP framework provides a robust strategy to shift intermittent water supply (IWS) into continuous water supply. The IUWSI highlighted the state of water security in Madaba, Jordan and identified the means of implementation to move towards achieving urban water security based on the priorities for Madaba. The drinking water and human wellbeing dimension was the most important priority, receiving a weight of 66.22%, followed by ecosystem (17.15%), socioeconomic aspects (10.18%), and climate change and water-related hazards (6.45%) dimensions. The IUWSI indicated that the urban water security in Madaba is reasonable with a

score of 2.5/5 and can meet the minimum requirements in several dimensions, but nonetheless, it has many loopholes to cover. Gaps are clear in the climate change and water-related hazards, and socioeconomic dimensions with scores of 1.6/5 and 2.237/5 respectively. Additionally, specific shortcomings are found in indicators such as water availability, reliability, diversity, and public health. The IUWSI framework assists with a rational and evidence-based decision-making process, which is important for enhancing water resource management in water-scarce cities

Sustainable Production and Logistics - Eren Ozceylan 2021-04-26

Sustainable Production and Logistics: Modeling and Analysis Subject Guide: Engineering - Industrial & Manufacturing This book presents issues faced by planners of production and distribution operations in terms of smart manufacturing and sustainability, using efficient quantitative techniques in a variety of decision-making situations. Addressing the state-of-the-art of the smart and sustainable sides of production and distribution planning operations, it highlights how a current issue can be effectively approached and what particular quantitative technique can be used. The book goes on to provide a foundation in the new and fast-growing digital journey, and includes logistics 4.0 inside Industry 4.0, along with case studies. The information in this book is useful worldwide, especially in the Americas, Europe, Turkey, and Japan. It is written for academicians, researchers, practitioners, and students.

Handbook of Research on 5G Networks and Advancements in Computing, Electronics, and Electrical Engineering - Nwajana, Augustine O. 2021-06-25

The advent of the emerging fifth generation (5G) networks has changed the paradigm of how computing, electronics, and electrical (CEE) systems are interconnected. CEE devices and systems, with the help of the 5G technology, can now be seamlessly linked in a way that is rapidly turning the globe into a digital world. Smart cities and internet of things have come to stay but not without some challenges, which must be discussed. The Handbook of Research on 5G Networks and Advancements in Computing, Electronics, and Electrical Engineering focuses on current technological innovations as the world rapidly heads towards becoming a global smart city. It covers important topics such as power systems, electrical engineering, mobile communications, network, security, and more. This book examines vast types of technologies and their roles in society with a focus on how each works, the impacts it has, and the future for developing a global smart city. This book is ideal for both industrial and academic researchers, scientists, engineers, educators, practitioners, developers, policymakers, scholars, and students interested in 5G technology and the future of engineering, computing, and technology in human society.

Unmanned Driving Systems for Smart Trains - Hui Liu 2020-11-13

Unmanned Driving Systems for Smart Trains explores the core technologies involved in unmanned driving systems for smart railways and trains, from foundational theory to the latest advances. The volume introduces the key technologies, research results and frontiers of the field. Each chapter includes practical cases to ground theory in practice. Seven chapters cover key aspects of unmanned driving systems for smart trains, including performance evaluation, algorithm-based reasoning and learning strategy, main control parameters, data mining and processing, energy saving optimization and control, and intelligent algorithm simulation platforms. This book will help researchers find solutions in developing better unmanned driving systems. Responds to the expansion of smart railways and the adoption of unmanned global systems Covers core technologies of unmanned driving systems for smart trains Details a large number of case studies and experimental designs for unmanned railway systems Adopts a multidisciplinary view where disciplines intersect at key points Gives both foundational theory and the latest theoretical and practical advances for unmanned railways

Intelligent Human Systems Integration (IHSI 2022): Integrating People and Intelligent Systems - Tareq Ahram, Waldemar Karwowski, Pepetto Di Bucchianico, Redha Taiar, Luca Casarotto and Pietro Costa 2022-02-24

Proceedings of the 5th International Conference on Intelligent Human Systems Integration (IHSI 2022): Integrating People and Intelligent Systems, February 22-24, 2022, Venice, Italy

NEUTROSOPHIC-CUBIC ANALYTIC HIERARCHY PROCESS WITH APPLICATIONS - MUHAMMAD GULISTAN

In this paper we extend fuzzy analytic hierarchy process into neutrosophic cubic environment. The

neutrosophic cubic analytic hierarchy process can be used to manage more complex problems when the decision makers has a number of uncertainty, assigning preferences values to the considered object. We also define the concept of triangular neutrosophic cubic numbers and their operations laws. The advantages of the proposed methodology and the application of neutrosophic cubic analytic hierarchy process in decision making are shown by testing the numerical example in practical life.

Advances and Applications of DSMT for Information Fusion, Vol. IV - Florentin Smarandache, Jean Dezert 2015-03-01

The fourth volume on Advances and Applications of Dezert-Smarandache Theory (DSMT) for information fusion collects theoretical and applied contributions of researchers working in different fields of applications and in mathematics. The contributions (see List of Articles published in this book, at the end of the volume) have been published or presented after disseminating the third volume (2009, <http://fs.gallup.unm.edu/DSMT-book3.pdf>) in international conferences, seminars, workshops and journals.

ECKM2010-Proceedings of the 11th European Conference on Knowledge Management - Eduardo Tomé 2010

Engineering Geology for Society and Territory - Volume 3 - Giorgio Lollino 2014-08-21

This book is one out of 8 IAEG XII Congress volumes and deals with river basins, which are the focus of many hydraulic engineering and hydrogeological studies worldwide. Such studies examine river systems as both a resource of the fluvial environment, and also explore river-related hazards and risks. The contributions of researchers from different disciplines focus on: surface-groundwater exchanges, stream flow, stream erosion, river morphology and management, sediment transport regimes, debris flows, evaluation of water resources, dam operation and hydropower generation, flood risks and flood control, stream pollution and water quality management. The contributions include case studies for advancing field monitoring techniques, improving modeling and assessment of rivers and studies contributing to better management plans and policies for the river environment and water resources. The Engineering Geology

for Society and Territory volumes of the IAEG XII Congress held in Torino from September 15-19, 2014, analyze the dynamic role of engineering geology in our changing world and build on the four main themes of the congress: environment, processes, issues and approaches. The congress topics and subject areas of the 8 IAEG XII Congress volumes are: Climate Change and Engineering Geology. Landslide Processes. River Basins, Reservoir Sedimentation and Water Resources. Marine and Coastal Processes. Urban Geology, Sustainable Planning and Landscape Exploitation. Applied Geology for Major Engineering Projects. Education, Professional Ethics and Public Recognition of Engineering Geology. Preservation of Cultural Heritage.

Decision Making with the Analytic Network Process - Thomas L. Saaty 2013-05-14

The Analytic Network Process (ANP), developed by Thomas Saaty in his work on multicriteria decision making, applies network structures with dependence and feedback to complex decision making. This new edition of Decision Making with the Analytic Network Process is a selection of the latest applications of ANP to economic, social and political decisions, and also to technological design. The ANP is a methodological tool that is helpful to organize knowledge and thinking, elicit judgments registered in both in memory and in feelings, quantify the judgments and derive priorities from them, and finally synthesize these diverse priorities into a single mathematically and logically justifiable overall outcome. In the process of deriving this outcome, the ANP also allows for the representation and synthesis of diverse opinions in the midst of discussion and debate. The book focuses on the application of the ANP in three different areas: economics, the social sciences and the linking of measurement with human values. Economists can use the ANP for an alternate approach for dealing with economic problems than the usual mathematical models on which economics bases its quantitative thinking. For psychologists, sociologists and political scientists, the ANP offers the methodology they have sought for some time to quantify and derive measurements for intangibles. Finally the book applies the ANP to provide people in the physical and engineering sciences with a quantitative method to link hard measurement to human values. In such a process, one is able to interpret the true meaning of measurements made on a uniform scale using a unit.