The Decision Making Network An Introduction To Criminal Justice

Multiple Attribute Decision MakingManagement in NetworksIntegrated Uncertainty in Knowledge Modelling and Decision MakingGroup Interest in Decision Making: Yes We Can!?Structured Decision MakingMultiple Criteria Decision Making in Application Layer NetworksManaging Uncertainties in NetworksMigration Decision MakingNeuroscience of Decision MakingUncertainty Analysis in Engineering and Sciences: Fuzzy Logic, Statistics, and Neural Network ApproachCollective Decision MakingData Mining and Statistics for Decision MakingDecision Making Under UncertaintyFuzzy-Like Multiple Objective Multistage Decision MakingDecision Making with the Analytic Network ProcessDecision Making with Dependence and FeedbackDecision-Making for Supply Chain IntegrationScalability, Density, and Decision Making in Cognitive Wireless NetworksCollaborative Decision MakingRisk Assessment and Decision Analysis with Bayesian NetworksMathematical Principles of Decision Making (Principia Mathematica Decernendi)The Decision MakerDecision Making Applications in Modern Power SystemsDecision Making in Natural Resource ManagementThe Analytic Hierarchy Process in Natural Resource and Environmental Decision MakingGroup Decision MakingDeveloping an Organizational Decision Making ModelDecision MakingHandbook of Decision MakingTheory and Applications of the Analytic Network ProcessDecision Support Systems II - Recent Developments Applied to DSS Network EnvironmentsDecision Making with the Analytic Network ProcessNetwork Meta-Analysis for Decision-MakingThe Decision-making NetworkMultiple Criteria Decision Making in Supply Chain ManagementBayesian Networks and Influence Diagrams: A Guide to Construction and AnalysisSupported Decision-MakingIntelligent Decision Making: An AI-Based ApproachScalability, Density, and Decision Making in Cognitive Wireless NetworksEmotion and Decision-making Explained

Multiple Attribute Decision Making

Probabilistic networks, also known as Bayesian networks and influence diagrams, have become one of the most promising technologies in the area of applied artificial intelligence. This book provides a comprehensive guide for practitioners who wish to understand, construct, and analyze intelligent systems for decision support based on probabilistic networks. Intended primarily for practitioners, this book does not require sophisticated mathematical skills. The theory and methods presented are illustrated through more than 140 examples, and exercises are included for the reader to check his/her level of understanding.

Management in Networks

Integrated Uncertainty in Knowledge Modelling and Decision Making

This book constitutes the refereed proceedings of the International Symposium on Integrated Uncertainty in Knowledge Modeling and Decision Making, IUKM 2013, held in Beijing China, in July 2013. The 19 revised full papers were carefully reviewed and selected from 49 submissions and are presented together with keynote and invited talks. The papers provide a wealth of new ideas and report both theoretical and applied research on integrated uncertainty modeling and management.

Group Interest in Decision Making: Yes We Can!?

Structured Decision Making

When faced with complicated, potentially controversial decisions that affect our environment, many resource management agencies have come to realize the value of structured decision making (SDM)â€"the systematic use of principles and tools of decision analysis. Few professionals, however, have extensive experience implementing SDM. Structured Decision Making provides key information to both current adopters of the method and those who are deploying it for the first time by demonstrating the formal use of decision analysis to support difficult, real-world natural resource management decisions. Drawing on case studies from multiple public agencies in the United States, Canada, Australia, and Mauritius, the editors present an overview of decision analysis, a classification of decision types, and a catalog of decision analysis methods. Dozens of detailed charts and maps help contextualize the material. These case studies examine a rich variety of topics, including • keeping forest birds free from disease • conserving imperiled freshwater mussels • managing water for oil sands mining • dealing with coastal wetlands in the face of sea-level rise • designing networks for prairie-dependent taxa • combatting invasive alpine shrubs • managing vernal pool habitats for obligate amphibian species • and much more Aimed at decision makers tackling natural resource challenges in government agencies around the world, as well as advanced undergraduate and graduate students preparing to work in natural resource management, Structured Decision Making shows how SDM can be implemented to achieve optimal outcomes that integrate social values and scientific understanding. Contributors: Taber D. Allison, Larissa L. Bailey, Ellen A. Bean, Clint W. Boal, Gregory Breese, Stefano Canessa, Jean Fitts Cochrane, Sarah J. Converse, Cami S. Dixon, John G. Ewen, Christelle Ferrière, Jill J. Gannon, Beth Gardner, Adam W. Green, Justin A. Gude, Victoria M. Hunt, Kevin S. Kalasz, Melinda G. Knutson, Jim Kraus, Graham Long, Eric V. Lonsdorf, James E. Lyons, Conor P. McGowan, Sarah E. McRae, Michael S. Mitchell, Clinton T. Moore, Joslin L. Moore, Steven Morey, Dan W. Ohlson, Charlie Pascoe, Andrew Paul, Eben H. Paxton, Lori B. Pruitt, Michael C. Runge, Sarah N. Sells, Terry L. Shaffer, Stephanie Slade, David R. Smith, Jennifer A. Szymanski, Terry Walshe, Nicolas Zuël

Multiple Criteria Decision Making in Application Layer Networks

Getting what you want – even if you are the boss – isn't always easy. Almost every organization, big or small, works among a network of competing interests. Whether it's governments pushing through policies, companies trying to increase profits, or even families deciding where to move house, rarely can decisions be made in isolation from competing interests both within the organization and outside it. In this accessible and straightforward account, Hans de Bruijn and Ernst ten Heuvelhof cast light on multi-stakeholder decision-making. Shunning simplistic model talk, they reveal the nuts and bolts of decision-making within the numerous dilemmas and tensions at work. Using a diverse range of illustrative examples throughout, their perceptive analysis examines how different interests can either support or block change, and the strategies available in managing a variety of stakeholders This insightful text provides both depth of understanding and a wealth of advice. It is invaluable reading to students working in business and management, public administration and organizational studies, plus practitioners – or actors – operating in a range of contexts.

Managing Uncertainties in Networks

Harrie de Swart is a Dutch logician and mathematician with a great and open int- est in applications of logic. After being confronted with Arrow's Theorem, Harrie became very interested in social choice theory. In 1986 he took the initiative to start up a group of Dutch scientists for the study of social choice theory. This initiative grew out to a research group and a series of colloquia, which were held approximately every month at the University of Tilburg in The Netherlands. The organization of the colloquia was in the hands of Harrie and under his guidance they became more and more internationally known. Many international scholars liked visiting the social choice colloquia in Tilburg and enjoyed giving one or more presentations about their work. They liked Harrie's kindness and hospitality, and the openness of the group for anything and everything in the eld of social choice. The Social Choice Theory Group started up by Harrie consisted, and still c- sists, of scholars from several disciplines; mostly economics, mathematics, and (mathematical) psychology. It was set up for the study of and discussion about anything that had to do with social choice theory including, and not in the least, the supervision of PhD students in the theory. Members of the group were, among o- ers, Thom Bezembinder (psychologist), Hans Peters (mathematician), Pieter Ruys (economist), Stef Tijs (mathematician and game theorist) and, of course, Harrie de Swart (logician and mathematician).

Migration Decision Making

Migration Decision Making: Multidisciplinary Approaches to Microlevel Studies and Developing Countries discusses several topics, such as systematics review and evaluation of microlevel frameworks and models of the migration decision;

applicability of microlevel migration models and framework; and general policy implications of microlevel models and frame works. The opening chapter introduces the main themes and provides an overview of the book. Chapter 2 discusses the motivation for migration, an assessment and a value-expectancy research model, and the next chapter tackles macrolevel influences on the migration decision process. Chapter 4 covers microeconomic approaches to studying migration decisions, while Chapter 5 discusses information, uncertainty, and the microeconomic model of migration decision making. The sixth chapter talks about moving toward a development paradigm of migration, with particular reference to third world countries, and the seventh chapter discusses village-community ties, village norms, and ethnic and social networks. Chapter 8 covers family structure and family strategy in migration decision making, and then Chapter 9 discusses the migration decision-making process, emphasizing some social-psychological considerations. Chapter 10 tackles policy intervention considerations, focusing on the relationship of theoretical models to planning, and Chapter 11 discusses the utility of microlevel approach to migration, using a Philippine perspective. The last chapter is a review of micro migration research in the third world context. This book will be of great interest to sociologists, economists, law makers, and government agencies who are concerned with the implications of migrations.

Neuroscience of Decision Making

A practical guide to network meta-analysis with examples and code In the evaluation of healthcare, rigorous methods of quantitative assessment are necessary to establish which interventions are effective and cost-effective. Often a single study will not provide the answers and it is desirable to synthesise evidence from multiple sources, usually randomised controlled trials. This book takes an approach to evidence synthesis that is specifically intended for decision making when there are two or more treatment alternatives being evaluated, and assumes that the purpose of every synthesis is to answer the question "for this pre-identified population of patients, which treatment is 'best'?" A comprehensive, coherent framework for network meta-analysis (mixed treatment comparisons) is adopted and estimated using Bayesian Markov Chain Monte Carlo methods implemented in the freely available software WinBUGS. Each chapter contains worked examples, exercises, solutions and code that may be adapted by readers to apply to their own analyses. This book can be used as an introduction to evidence synthesis and network meta-analysis, its key properties and policy implications. Examples and advanced methods are also presented for the more experienced reader. Methods used throughout this book can be applied consistently: model critique and checking for evidence consistency are emphasised. Methods are based on technical support documents produced for NICE Decision Support Unit, which support the NICE Methods of Technology Appraisal. Code presented is also the basis for the code used by the ISPOR Task Force on Indirect Comparisons. Includes extensive carefully worked examples, with thorough explanations of how to set out data for use in WinBUGS and how to interpret the output. Network Meta-Analysis for Decision Making will be of interest to decision makers, medical statisticians, health economists, and anyone involved in Health Technology Assessment including the pharmaceutical industry.

Uncertainty Analysis in Engineering and Sciences: Fuzzy Logic, Statistics, and Neural Network Approach

This invaluable book captures the proceedings of a workshop that brought together a group of distinguished scientists from a variety of disciplines to discuss how networking influences decision making. The individual lectures interconnect psychological testing, the modeling of neuron networks and brain dynamics to the transport of information within and between complex networks. Of particular importance was the introduction of a new principle that governs how complex networks talk to one another — the Principle of Complexity Management (PCM). PCM establishes that the transfer of information from a stimulating complex network to a responding complex network is determined by how the complexity indices of the two networks are related. The response runs the gamut from being independent of the perturbation to being completely dominated by it, depending on the complexity mismatch. Contents:Overview of ARO Program on Network Science for Human Decision Making (B J West)Viewing the Extended Mind Hypothesis(Clark & Chambers) in Terms of Complex Systems Dynamics (G Werner)Uncertainty in Psychophysics: Deriving a Network of Psychophysical Equations (K H Norwich)The Collective Brain (E Tagliazucchi and D R Chialvo)Acquiring Long-Range Memory Through Adaptive Avalanches (S Boettcher)Random Walk of Complex Networks: From Infinitely Slow to Instantaneous Transition to Equilibrium (N W Hollingshad, P Grigolini and P Allegrini)Coherence and Complexity (M Bologna, E Geneston, P Grigolini, M Turalska and M Lukovic)Quakes in Complex Systems as a Signature of Cooperation (E Geneston and P Grigolini)Renewal Processes in the Critical Brain (P Allegrini, P Paradisi, D Menicucci and A Gemignani)The Principle of Complexity Management (B J West and P Grigolini) Readership: For professional and research level studies in psychophysics. Keywords:Network Science;Complexity;Neural Avalanches;Brain Dynamics;Decision Making;Coherence;UncertaintyKey Features:Due to the heterogeneous nature of the audience the lectures avoid being overly specialized but maintain scientific integrity while reaching across disciplines thereby making them accessible to students at all levelsExplicit contact is made between the qualitative concepts of classical psychology such as the mind and the quantitative methods of psychophysics and neurophysiology by some of today's outstanding scientistsNo other treatment of decision making takes advantage of the technical developments that have been made in the analyses of complex networks over the past decade

Collective Decision Making

Organizational decision making can be seen as a complex process due to the fact that decisions across organizational levels are generally interdependent, and have effects ranging from immediate to long-lasting. Reviewing decision making mathematical and process models, decision making is fundamentally characterized by multiple decision making steps from encountering a problem to determining a course of action. The first objective of this dissertation was the determination of the decision making model that a certain type of organization uses, and the establishment of a foundation for an

organizational decision model framework. Decision making can be classified into three decision types: strategic, tactical, and operational. These types of decisions can be made throughout the organization ranging from an executive board to operating floor managers. A second objective of this dissertation was the determination of the decision making model that is used to make a certain decision type, and the continued development of an organizational decision making model framework. Beyond decision making occurring within the "traditional" organization structure, decision making can be influenced and occurs within the organizational social groups. These social networks established within the parent organization can make similar decisions to ones made within the "traditional" organizational structure. Metrics of social network analysis (SNA) were used to characterize the configuration of social networks associated with different organizational structures and types of decisions being made in the organization. These metrics showed organizational social networks had the same composition regardless of organizational structure and decision type, with one outlier that social networks would comprise of organizational members making the same type of organizational decision. The first two studies developed an organizational decision making model, respectively. These two studies' results showed none of the five researched decision making models being representative of how an organization makes decisions. Ultimately, these studies' results allowed a new organizational decision making model to be constructed.

Data Mining and Statistics for Decision Making

Supply chain management decisions are made under the conflicting criteria of maximizing profit and customer responsiveness while minimizing supply chain risk. Multiple Criteria Decision Making in Supply Chain Management provides a comprehensive overview of multi-criteria optimization models and methods that can be used in supply chain decision making. Presenting the contributions of internationally known authors, researchers, educators, and practitioners, this new book in the Operations Research Series provides readers with a single source guide to recent developments in this area. The focus of the book is on the design and operation of the supply chain system, which involves connecting many production and distribution systems, often across wide geographic distances, in such a way that the businesses involved can ultimately satisfy the consumer demand as efficiently as possible, resulting in maximum financial returns to those businesses connected to that supply chain system. The book includes several case studies on the design and operation of supply chain networks in manufacturing and healthcare.

Decision Making Under Uncertainty

This book shows how to make decisions when alternatives depend on criteria, but also the criteria depend on the alternatives. It shows how to cope with dependence between different groups of people, goals and criteria. The Analytic Network Process is particularly useful to project the future of a group or company considering all the influences and risks:

economic, social, political, technological, environmental, and others. Accompanying ANP software is under development.

Fuzzy-Like Multiple Objective Multistage Decision Making

This note from Prof. Vargas regarding a competitive title by Prof. Saaty with an almost identical title (THEORY AND APPLICATIONS OF THE ANALYTIC NETWORK PROCESS: Decision Making with Benefits, Opportunities, Costs, and Risks. RWS Publications, 2005): "The other book is theoretical with passing mention of examples to show how the subject is used. In our book (the one you have) the applications are different and given in full detail relevance and originality. They have never appeared in print as they are here and most users would prefer them to the theoretical book. In addition chapter 1 summarizes the theory given in four chapters on the book showing the important parts without going into too much detail. I would rather read this book than the other one definitely and this could not have been done so elegantly had not the other been written before. Therefore this book has the cream of the ideas and the best published applications so far."

Decision Making with the Analytic Network Process

"This cohesive treatment of cognitive radio and networking technology integrates information and decision theory to provide insight into relationships throughout all layers of networks and across all wireless applications. It encompasses conventional considerations of spectrum and waveform selection, and covers topology determination, routing policies, content positioning, and future hybrid architectures that fully integrate wireless and wired services. Features specific examples of decision-making structures and criteria required to extend network density and scaling to unprecedented levels. - Integrates sensing, control plane and content operations into a single cohesive structure - Provides simpler and more powerful models of network operation - Presents a unique approach to decision-making and mechanisms to adjust control plane activity to ensure network scaling. - Generalises the concepts of shared and adaptive spectrum policies - Addresses network transport operations and dynamic management of cognitive wireless networks' own information seeking behaviour"--

Decision Making with Dependence and Feedback

Who makes the important decisions in your organization? Strategy, product development, budgeting, compensation—such key decisions typically are made by company leaders. That's what bosses are for, right? But maybe the boss isn't the best person to make the call. That's the conclusion Dennis Bakke came to, and he used it to build AES into a Fortune 200 global power company with 27,000 people in 27 countries. He used it again to create Imagine Schools, the largest non-profit charter-school network in the U.S. As a student at Harvard Business School, Bakke made hundreds of decisions using the

case-study method. He realized two things: decision-making is the best way to develop people; and that shouldn't stop at business school. So Bakke spread decision-making throughout his organizations, fully engaging people at all levels. Today, Bakke has given thousands of people the freedom and responsibility to make decisions that matter. In The Decision Maker, a leadership fable loosely based on Bakke's experience, the New York Times bestselling author shows us how giving decisions to the people closest to the action can transform any organization. The idea is simple. The results are powerful. When leaders put real control into the hands of their people, they tap incalculable potential. The Decision Maker, destined to be a business classic, holds the key to unlocking the potential of every person in your organization.

Decision-Making for Supply Chain Integration

Uncertainty has been of concern to engineers, managers and . scientists for many centuries. In management sciences there have existed definitions of uncertainty in a rather narrow sense since the beginning of this century. In engineering and uncertainty has for a long time been considered as in sciences, however, synonymous with random, stochastic, statistic, or probabilistic. Only since the early sixties views on uncertainty have ~ecome more heterogeneous and more tools to model uncertainty than statistics have been proposed by several scientists. The problem of modeling uncertainty adequately has become more important the more complex systems have become, the faster the scientific and engineering world develops, and the more important, but also more difficult, forecasting of future states of systems have become. The first question one should probably ask is whether uncertainty is a phenomenon, a feature of real world systems, a state of mind or a label for a situation in which a human being wants to make statements about phenomena, i. e. , reality, models, and theories, respectively. One cart also ask whether uncertainty is an objective fact or just a subjective impression which is closely related to individual persons. Whether uncertainty is an objective feature of physical real systems seems to be a philosophical question. This shall not be answered in this volume.

Scalability, Density, and Decision Making in Cognitive Wireless Networks

This publication presents the latest innovations and achievements of academic communities on Decision Support Systems (DSS). These advances include theory systems, computer-aided methods, algorithms, techniques and applications related to supporting decision making. The aim is to develop approaches for applying information systems technology to increase the effectiveness of decision making in situations where the computer system can support and enhance human judgments in the performance of tasks that have elements which cannot be specified in advance. Also it is intended to improve ways of synthesizing and applying relevant work from resource disciplines to practical implementation of systems that enhance decision support capability.The resource disciplines include: information technology, artificial intelligence, cognitive psychology, decision theory, organizational theory, operations research and modeling. Researchers come from the

Operational Research area but also from Decision Theory, Multicriteria Decision Making methodologies, Fuzzy sets and modeling tools. Based on the introduction of Information and Communication Technologies in organizations, the decisional process is evolving from a mono actor to a multi actor situation in which cooperation is a way to make the decision.

Collaborative Decision Making

The United Nations Convention on the Rights of Persons with Disabilities (CRPD) recognized that people with disabilities should have the right to exercise their legal capacity and identified 'supported decision-making' as a means by which people with disabilities can be directly involved in decisions that impact their lives. Offering an overview of its emergence in the disability field and highlighting emerging research, theory, and practice from legal, psychology, education, and health fields, this volume provides a much-needed theoretical and evidence base for supported decision-making. Evidence and strengths-based frameworks for understanding disability, supports, and their roles in promoting supported decision-making are synthesized. The authors describe the application of a social-ecological approach to supported decision-making, and focus on implications for building systems of supports based on current environmental demands. This volume introduces and explains empirical research on critical elements of supported decision-making and the applications of supported decision-making that enhance outcomes, including self-determination and quality of life.

Risk Assessment and Decision Analysis with Bayesian Networks

When a group makes a decision, that decision carries a lot more weight than when just one person does it. Think of the founding fathers of the American constitution and how much power and influence their ideas have had in the entire world for more than two hundred years. Also think of gravity, a universal force brought about by an enormous number of minute particles that band together to make a universal law. Together, they create a massive force, a law of nature; alone they can barely be noticed. That is how our minds work by deciding together to create a power that transcends our individuality. Group decision making is a gift and an opportunity to create greater influence through the working together of many minds. This book shows how to use the Analytic Hierarchy Process for hierarchical decision making and the Analytic Network Process for decision making in networks with dependence and feedback in group decision making. Part I discusses the group and the decision and shows the importance of using a structured process, particularly for those high value decisions involving many powerful parties with different interests. It discusses how to facilitate a group decision, combine individual judgments and smooth differences to arrive at a decision that everyone can live with and get behind. Part II discusses the group in planning and how to draw out differences. Part III is about conflict resolution and Part IV is about how to address significant issues that come up in group decision making and shows that it is possible to construct an overall group preference.

Mathematical Principles of Decision Making (Principia Mathematica Decernendi)

An introduction to decision making under uncertainty from a computational perspective, covering both theory and applications ranging from speech recognition to airborne collision avoidance. Many important problems involve decision making under uncertainty—that is, choosing actions based on often imperfect observations, with unknown outcomes. Designers of automated decision support systems must take into account the various sources of uncertainty while balancing the multiple objectives of the system. This book provides an introduction to the challenges of decision making under uncertainty from a computational perspective. It presents both the theory behind decision making models and algorithms and a collection of example applications that range from speech recognition to aircraft collision avoidance. Focusing on two methods for designing decision agents, planning and reinforcement learning, the book covers probabilistic models, introducing Bayesian networks as a graphical model that captures probabilistic relationships between variables; utility theory as a framework for understanding optimal decision making under uncertainty; Markov decision processes as a method for modeling sequential problems; model uncertainty; state uncertainty; and cooperative decision making involving multiple interacting agents. A series of applications shows how the theoretical concepts can be applied to systems for attribute-based person search, speech applications, collision avoidance, and unmanned aircraft persistent surveillance. Decision Making Under Uncertainty unifies research from different communities using consistent notation, and is accessible to students and researchers across engineering disciplines who have some prior exposure to probability theory and calculus. It can be used as a text for advanced undergraduate and graduate students in fields including computer science, aerospace and electrical engineering, and management science. It will also be a valuable professional reference for researchers in a variety of disciplines.

The Decision Maker

The Analytic Hierarchy Process (AHP) and its generalization to dependence and feedback, the Analytic Network Process (ANP), are methods of relative measurement of tangibles and intangibles. Being able to derive such measurements is essential for making good decisions. This book is based on the Analytic Network Process and lays out a new approach for making decisions in light of their benefits, opportunities, costs and risks (BOCR) shows how to include the strategic criteria of the decision-maker that must be satisfied regardless of the particular decision being undertaken. This book includes all the important background material from the earlier book, The Analytic Network Process: Decision Making with Dependence and Feedback, published in 2001, and goes farther with new examples of estimating market share of companies based on the intangibles of customer perception, and new applications involving Benefits, Opportunities, Costs and Risks.

Decision Making Applications in Modern Power Systems

Over time, thought processes and decision making styles evolved and were shaped by theological, philosophical, political, social, and environmental factors and trends. Recently, advances in technology have borne an unprecedented influence on our social environment. Contemporary thinking inevitably reflects this influence and moves us from a linear,

Decision Making in Natural Resource Management

This book contains extended and revised versions of a set of selected papers from two workshops organized by the Euro Working Group on Decision Support Systems (EWG-DSS), which were held in Liverpool, UK, and Vilnius, Lithuania, in April and July 2012. From a total of 33 submissions, 9 papers were accepted for publication in this edition after being reviewed by at least three internationally known experts from the EWG-DSS Program Committee and external invited reviewers. The selected papers are representative of the current research activities in the area of decision support systems, focusing on topics such as decision analysis for enterprise systems and non-hierarchical networks, integrated solutions for decision support and knowledge management in distributed environments, decision support system evaluation and analysis through social networks, and e-learning and its application to real environments.

The Analytic Hierarchy Process in Natural Resource and Environmental Decision Making

Decision Making Applications in Modern Power Systems presents an enhanced decision-making framework for power systems. Designed as an introduction to enhanced electricity system analysis using decision-making tools, it provides an overview of the different elements, levels and actors involved within an integrated framework for decision-making in the power sector. In addition, it presents a state-of-play on current energy systems, strategies, alternatives, viewpoints and priorities in support of decision-making in the electric power sector, including discussions of energy storage and smart grids. As a practical training guide on theoretical developments and the application of advanced methods for practical electrical energy engineering problems, this reference is ideal for use in establishing medium-term and long-term strategic plans for the electric power and energy sectors. Provides panoramic coverage of state-of-the-art energy systems, strategies and priorities in support of electrical power decision-making Introduces innovative research outcomes, programs, algorithms and approaches to address challenges in understanding, creating and managing complex techno-socio-economic engineering systems Includes practical training on theoretical developments and the application of advanced methods for realistic electrical energy engineering problems

Group Decision Making

Intelligent Decision Support Systems have the potential to transform human decision making by combining research in

artificial intelligence, information technology, and systems engineering. The field of intelligent decision making is expanding rapidly due, in part, to advances in artificial intelligence and network-centric environments that can deliver the technology. Communication and coordination between dispersed systems can deliver just-in-time information, real-time processing, collaborative environments, and globally up-to-date information to a human decision maker. At the same time, artificial intelligence techniques have demonstrated that they have matured sufficiently to provide computational assistance to humans in practical applications. This book includes contributions from leading researchers in the field beginning with the foundations of human decision making and the complexity of the human cognitive system. Researchers contrast human and artificial intelligence, survey computational intelligence, present pragmatic systems, and discuss future trends. This book will be an invaluable resource to anyone interested in the current state of knowledge and key research gaps in the rapidly developing field of intelligent decision support.

Developing an Organizational Decision Making Model

Data mining is the process of automatically searching large volumes of data for models and patterns using computational techniques from statistics, machine learning and information theory; it is the ideal tool for such an extraction of knowledge. Data mining is usually associated with a business or an organization's need to identify trends and profiles, allowing, for example, retailers to discover patterns on which to base marketing objectives. This book looks at both classical and recent techniques of data mining, such as clustering, discriminant analysis, logistic regression, generalized linear models, regularized regression, PLS regression, decision trees, neural networks, support vector machines, Vapnik theory, naive Bayesian classifier, ensemble learning and detection of association rules. They are discussed along with illustrative examples throughout the book to explain the theory of these methods, as well as their strengths and limitations. Key Features: Presents a comprehensive introduction to all techniques used in data mining and statistical learning, from classical to latest techniques. Starts from basic principles up to advanced concepts. Includes many step-by-step examples with the main software (R, SAS, IBM SPSS) as well as a thorough discussion and comparison of those software. Gives practical tips for data mining implementation to solve real world problems. Looks at a range of tools and applications, such as association rules, web mining and text mining, with a special focus on credit scoring. Supported by an accompanying website hosting datasets and user analysis. Statisticians and business intelligence analysts, students as well as computer science, biology, marketing and financial risk professionals in both commercial and government organizations across all business and industry sectors will benefit from this book.

Decision Making

Although many Bayesian Network (BN) applications are now in everyday use, BNs have not yet achieved mainstream

penetration. Focusing on practical real-world problem solving and model building, as opposed to algorithms and theory, Risk Assessment and Decision Analysis with Bayesian Networks explains how to incorporate knowledge with data to develop and use (Bayesian) causal models of risk that provide powerful insights and better decision making. Provides all tools necessary to build and run realistic Bayesian network models Supplies extensive example models based on real risk assessment problems in a wide range of application domains provided; for example, finance, safety, systems reliability, law, and more Introduces all necessary mathematics, probability, and statistics as needed The book first establishes the basics of probability, risk, and building and using BN models, then goes into the detailed applications. The underlying BN algorithms appear in appendices rather than the main text since there is no need to understand them to build and use BN models. Keeping the body of the text free of intimidating mathematics, the book provides pragmatic advice about model building to ensure models are built efficiently. A dedicated website, www.BayesianRisk.com, contains executable versions of all of the models described, exercises and worked solutions for all chapters, PowerPoint slides, numerous other resources, and a free downloadable copy of the AgenaRisk software.

Handbook of Decision Making

What produces emotions? Why do we have emotions? How do we have emotions? Why do emotional states feel like something? What is the relation between emotion, and reward value, and subjective feelings of pleasure? How is the value of a good represented in the brain? Will neuroeconomics replace classical microeconomics? How does the brain implement decision-making? Are gene-defined rewards and emotions in the interests of the genes, and does rational multistep planning enable us to go beyond selfish genes to long-term plans and social contracts in the interests of the individual? This book seeks explanations of emotion and decision-making by considering these questions. The topics covered include: The nature of emotion, and a theory of emotion The functions of emotion, including a Darwinian theory of the adaptive value of emotion, which helps to illuminate many aspects of brain design and behaviour The brain mechanisms of emotion Affective states and motivated behaviour: hunger and sexual behaviour The pharmacology of emotion, and brain mechanisms for action Neuroeconomics, and the foundation of economic value Decision-making Emotional feelings, and consciousness Neural networks involved in emotion The book will be valuable for those in the fields of neuroscience and neurology, psychology, psychiatry, and philosophy

Theory and Applications of the Analytic Network Process

This book is intended for use by natural resource managers andscientists, and students in the fields of natural resourcemanagement, ecology, and conservation biology, who are confrontedwith complex and difficult decision making problems. The book takesreaders through the process of developing a structured approach todecision making, by firstly

deconstructing decisions into componentparts, which are each fully analyzed and then reassembled to form aworking decision model. The book integrates common-senseideas about problem definitions, such as the need for decisions tobe driven by explicit objectives, with sophisticated approaches formodeling decision influence and incorporating feedback frommonitoring programs into decision making via adaptive management.Numerous worked examples are provided for illustration, along withdetailed case studies illustrating the authors' experience inapplying structured approaches. There is also a series of detailedtechnical appendices. An accompanying website providescomputer code and data used in the worked examples. Additional resources for this book can be foundat: ahref="http://www.wiley.com/go/conroy/naturalresourcemanagement"www.wiley.com/go/conroy/naturalresourcemanagement/a.

Decision Support Systems II - Recent Developments Applied to DSS Network Environments

The intersection between the fields of behavioral decision research and neuroscience has proved to be fertile ground for interdisciplinary research. Whereas the former is rich in formalized models of choice, the latter is rife with techniques for testing behavioral models at the brain level. As a result, there has been the rapid emergence of progressively more sophisticated biological models of choice, geared toward the development of ever more complete mechanistic models of behavior. This volume provides a coherent framework for distilling some of the key themes that have emerged as a function of this research program, and highlights what we have learned about judgment and decision making as a result. Although topics that are theoretically relevant to judgment and decision making researchers are addressed, the book also ventures somewhat beyond the traditional boundaries of this area to tackle themes that would of interest to a greater community of scholars. Neuroscience of Decision Making provides contemporary and essential reading for researchers and students of cognitive psychology, neuroscience, philosophy, and economics.

Decision Making with the Analytic Network Process

"This cohesive treatment of cognitive radio and networking technology integrates information and decision theory to provide insight into relationships throughout all layers of networks and across all wireless applications. It encompasses conventional considerations of spectrum and waveform selection, and covers topology determination, routing policies, content positioning, and future hybrid architectures that fully integrate wireless and wired services. Features specific examples of decision-making structures and criteria required to extend network density and scaling to unprecedented levels. - Integrates sensing, control plane and content operations into a single cohesive structure - Provides simpler and more powerful models of network operation - Presents a unique approach to decision-making and mechanisms to adjust control plane activity to ensure network scaling. - Generalises the concepts of shared and adaptive spectrum policies - Addresses network transport operations and dynamic management of cognitive wireless networks' own information seeking

behaviour"--

Network Meta-Analysis for Decision-Making

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.

The Decision-making Network

Effective supply chain integration, and the tight co-ordination it creates, is an essential pre-requisite for successful supply chain management. Decision-Making for Supply Chain Integration is a practical reference on recent research in the area of supply chain integration focusing on distributed decision-making problems. Recent applications of various decision-making tools for integrating supply chains are covered including chapters focusing on: Supplier selection, pricing strategy and inventory decisions in multi-level supply chains, RFID-enabled distributed decision-making, Operational risk issues and time-critical decision-making for sensitive logistics nodes, Modelling end to end processes to improve supply chain integration, and Integrated systems to improve service delivery and optimize resource use. Decision-Making for Supply Chain Integration provides an insight into the tools and methodologies of this field with support from real-life case studies demonstrating successful application of various decision-making techniques. By covering such a range of topics in this way, Decision-Making for Supply Chain Integration is a useful reference for researchers looking to develop their knowledge or find potential new avenues of research.

Multiple Criteria Decision Making in Supply Chain Management

Decision has inspired reflection of many thinkers since the ancient times. With the rapid development of science and society, appropriate dynamic decision making has been playing an increasingly important role in many areas of human activity including engineering, management, economy and others. In most real-world problems, decision makers usually have to make decisions sequentially at different points in time and space, at different levels for a component or a system, while facing multiple and conflicting objectives and a hybrid uncertain environment where fuzziness and randomness co-exist in a decision making process. This leads to the development of fuzzy-like multiple objective multistage decision making. This book provides a thorough understanding of the concepts of dynamic optimization from a modern perspective and presents the state-of-the-art methodology for modeling, analyzing and solving the most typical multiple objective multistage decision making practical application problems under fuzzy-like uncertainty, including the dynamic machine allocation, closed multiclass queueing networks optimization, inventory management, facilities planning and transportation assignment. A number of real-world engineering case studies are used to illustrate in detail the methodology. With its emphasis on problem-solving and applications, this book is ideal for researchers, practitioners, engineers, graduate students and upper-level undergraduates in applied mathematics, management science, operations research, information system, civil engineering, building construction and transportation optimization

Bayesian Networks and Influence Diagrams: A Guide to Construction and Analysis

Despite sophisticated technology and knowledge, the strategic networks and games required to solve uncertainties becomes more complex and more important than ever before.

Supported Decision-Making

Decision makers are often faced with several conflicting alternatives. How do they evaluate trade-offs when there are more than three criteria? To help people make optimal decisions, scholars in the discipline of multiple criteria decision making (MCDM) continue to develop new methods for structuring preferences and determining the correct relative weights for criteria. A compilation of modern decision-making techniques, Multiple Attribute Decision Making: Methods and Applications focuses on the fuzzy set approach to multiple attribute decision making (MADM). Drawing on their experience, the authors bring together current methods and real-life applications of MADM techniques for decision analysis. They also propose a novel hybrid MADM model that combines DEMATEL and analytic network process (ANP) with VIKOR procedures. The first part of the book focuses on the theory of each method and includes examples that can be calculated without a computer, providing a complete understanding of the procedures. Methods include the analytic hierarchy process (AHP), ANP, simple

additive weighting method, ELECTRE, PROMETHEE, the gray relational model, fuzzy integral technique, rough sets, and the structural model. Integrating theory and practice, the second part of the book illustrates how methods can be used to solve real-world MADM problems. Applications covered in the book include: AHP to select planning and design services for a construction project TOPSIS and VIKOR to evaluate the best alternative-fuel vehicles for urban areas ELECTRE to solve network design problems in urban transportation planning PROMETEE to set priorities for the development of new energy systems, from solar thermal to hydrogen energy Fuzzy integrals to evaluate enterprise intranet web sites Rough sets to make decisions in insurance marketing Helping readers understand how to apply MADM techniques to their decision making, this book is suitable for undergraduate and graduate students as well as practitioners.

Intelligent Decision Making: An AI-Based Approach

Diploma Thesis from the year 2008 in the subject Computer Science - Commercial Information Technology, grade: 1,3, University of Bayreuth (Lehrstuhl fur Wirtschaftsinformatik (BWL VII)), language: English, abstract: This work is concerned with the conduct of Multiple Criteria Decision Making (MCDM) by intelligent software agents trading digital commodities in Application Layer Networks (ALN) such as grids or clouds. These agents consider trustworthiness in their course of negotiation and select offers with respect to product price and seller reputation. To automate the selection process, we seek an appropriate MCDM method that provides clear advice for an agent prior to negotiating. We compare eleven well-known MCDM methods and choose the TOPSIS approach of Hwang and Yoon since it produces comprehensible and plausible results with a justifiable amount of effort. We modify the method and present a draft named xTOPSIS that promises intertemporal performance analysis for further automatation. The resulting tool is finally tested and evaluated in the context of a scenario similar to the eRep - Social Knowledge for e-Governance project."

Scalability, Density, and Decision Making in Cognitive Wireless Networks

In this book Thomas Saaty summarizes his Analytic Hierarchy Process (AHP) theory for measuring intangible factors through paired comparisons using judgments from which priorities are derived that give the relative dominance of these factors. The important concepts of the AHP and its generalization to structures with dependence and feedback, the Analytic Network Process (ANP), are presented in an elegant compact way and new extensions of the theory to complex decisions involving benefits, opportunities, costs and risks are presented. Applications to resource allocation and conflict resolution are included. The generalization to continuous comparisons is covered. The Encyclicon, three volumes are now available, is an encyclopedia of applications that is a useful accompaniment to the Principles of Mathematical Decision Making, containing of examples of practical decisions.

Emotion and Decision-making Explained

Decision making in land management involves preferential selection among competing alternatives. Often, such choices are difficult owing to the complexity of the decision context. Because the analytic hierarchy process (AHP, developed by Thomas Saaty in the 1970s) has been successfully applied to many complex planning, resource allocation, and priority setting problems in business, energy, health, marketing, natural resources, and transportation, more applications of the AHP in natural resources and environmental sciences are appearing regularly. This realization has prompted the authors to collect some of the important works in this area and present them as a single volume for managers and scholars. Because land management contains a somewhat unique set of features not found in other AHP application areas, such as site-specific decisions, group participation and collaboration, and incomplete scientific knowledge, this text fills a void in the literature on management science and decision analysis for forest resources.

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