Modifying Bayesian Networks By Probability Constraints

Effective administration of government and governmental organizations is a crucial part of achieving success in those organizations. To develop and implement best practices, policymakers and leaders must first understand the fundamental tenants and recent advances in public administration. Public Affairs and Administration: Concepts, Methodologies, Tools, and Applications explores the concept of governmental management, public policy, and politics at all levels of organizational governance. With chapters on topics ranging from privacy and surveillance to the impact of new media on political participation, this multi-volume reference work is an important resource for policymakers, government officials, and academicians and students of political science.

How should we reason in science? Jan Sprenger and Stephan Hartmann offer a refreshing take on classical topics in philosophy of science, using a single key concept to explain and to elucidate manifold aspects of scientific reasoning. They present good arguments and good inferences as being characterized by their effect on our rational degrees of belief. Refuting the view that there is no place for subjective attitudes in 'objective science', Sprenger and Hartmann explain the value of convincing evidence in terms of a cycle of variations on the theme of representing rational degrees of belief by means of subjective probabilities (and changing them by Bayesian conditionalization). In doing so, they integrate Bayesian inference—the leading theory of rationality in social science—with the practice of 21st century science. Bayesian Philosophy of Science thereby shows how modeling such attitudes improves our understanding of causes, explanations, confirming evidence, and scientific models in general. It combines a scientifically minded and mathematically sophisticated approach with conceptual analysis and attention to methodological problems of modern science, especially in statistical inference, and is therefore a valuable resource for philosophers and scientific practitioners.

This two-volume set LNCS 4803/4804 constitutes the refereed proceedings of the five confederated international conferences on Cooperative Information Systems (CoopIS 2007), Distributed Objects and Applications (DOA 2007), Ontologies, Databases and Applications of Semantics (ODBASE 2007), Grid computing, high performAnce and Distributed Applications (GADA 2007), and Information Security (IS 2007) held as OTM 2007 in Vilamoura, Portugal, in November 2007. The 95 revised full and 21 revised short papers presented together with 5 keynote talks were carefully reviewed and selected from a total of 362 submissions. Corresponding with the five OTM 2007 main conferences CoopIS, ODBASE, GADA, and DOA, the papers are organized in topical sections on process analysis and semantics, process modeling, P2P, collaboration, business transactions, dependability and security, middleware and web services, aspects and development tools, mobility and distributed algorithms, frameworks, patterns, and testbeds, ontology mapping, semantic querying, ontology development, learning and text mining, annotation and metadata management, ontology applications, data and storage, networks, collaborative grid environment and scientific grid applications, scheduling, middleware, data analysis, scheduling and management, access control and authentication, intrusion detection, system and services security, network security, malicious code and code security, as well as trust and information management.

The papers in this volume are the refereed application papers presented at AI-2006, the Twenty-sixth SGAI International Conference on Innovative Techniques and Applications of Artificial Intelligence, held in Cambridge in December 2006. The papers present new and innovative developments in the field. The series serves as a key reference as to how AI technology has enabled organisations to solve complex problems and gain significant business benefit.

Modeling Approaches and Algorithms for Advanced Computer Applications

Public Affairs and Administration: Concepts, Methodologies, Tools, and Applications

Proceedings of AI-2006, The Twenty-sixth SGAI International Conference on Innovative Techniques and Applications of Artificial Intelligence

Induction and Deduction in the Sciences

Concepts, Methodologies, Tools, and Applications

14th International Conference on Information Processing and Management of Uncertainty in Knowledge-Based Systems, IPMU 2012, Catania, Italy, July 9 - 13, 2012. Proceedings, Part III

The 33rd Annual German Conference on Artificial Intelligence (KI 2010) took place at the Karlsruhe Institute of Technology KIT, September 21–24, 2010, under the motto "Anthropomatic Systems." In this volume you will find the keynote paper and 49 papers of oral and poster presentations. The papers were selected from 73 submissions, resulting in an acceptance rate of 67%. As usual at the KI conferences, two entire days were allocated for targeted workshops—seven this year—and one tutorial. The workshop and tutorial ma- rials are not contained in this volume, but the conference website, www.ki2010.kit.edu,will provide information and references to their contents. Recent trends in AI research have been focusing on anthropomatic systems, which address synergies between humans and intelligent machines. This trend is emphasized through the topics of the overall conference program. They include learning systems, cognition, robotics, perception and action, knowledge rep- sentation and reasoning, and planning and decision making. Many topics deal with uncertainty in various scenarios and incompleteness of knowledge. Summarizing, KI 2010 provides a cross section of recent research in modern AI methods and anthropomatic system applications. We are very grateful that Jos edel Mill an, Hans-Hellmut Nagel, Carl Edward Rasmussen, and David Vernon accepted our invitation to give a talk.

Causality offers the first comprehensive coverage of causal analysis in many sciences, including recent advances using graphical methods. Pearl presents a unified account of the probabilistic, manipulative, counterfactual and structural approaches to causation, and devises simple mathematical tools for analyzing the relationships between causal connections, statistical associations, actions and observations. The book will open the way for including causal analysis in the standard curriculum of statistics, artificial intelligence ...

This innovative resource is the first book that partitions the intelligence, surveillance and reconnaissance (ISR) sensor management process into partitioned functions that can be studied and optimized independently of each other through defined conceptual interfaces. The book explains the difference between situation information and sensor information and how to compute both. The information-based sensor management (IBSM) approach to real-time orchestrated resource management (ORM) of intelligence, surveillance, and reconnaissance (ISR) assets in the physical, cyber, and social domains are detailed. The integrating concept of mission value through use of goal lattice (GL) methodology is explored. Approaches to implementing real-time sensor management (SM) systems by applying advanced information-based approaches that consider contextual situation and optimization of diverse sensor capabilities for information-based objectives are also covered. These methods have applications in physical intelligence, surveillance, and reconnaissance (ISR), as well as in cyber, and social domains. Based on 30 years of research in developing a mission-valued approach to maximizing the transfer of information from real, cyber, and social environments into a mission-valued, probabilistic representation of that environment on which decision makers can formulate actions, this is the only book that addresses real-time management of ISR from a first principles approach (information theory), and how information theory can be applied to the design and development of ISR systems.

Information and computer technologies for data analysis and processing in various fields of data mining and machine learning generates the conditions for increasing the effectiveness of information processing by making it faster and more accurate. The book includes 49 scientific papers presenting the latest research in the fields of data mining, machine learning and decision-making. Divided into three sections: "Analysis and Modeling of Complex Systems and Processes"; "Theoretical and Applied Aspects of Decision-Making Systems"; and "Computational Intelligence and Inductive Modeling", the book is of interest to scientists and developers in the field.

OTM Confederated International Conferences, CoopIS, DOA, ODBASE, GADA, and IS 2007, Vilamoura, Portugal, November 25-30, 2007, Proceedings, Part I

Sixth Annual Workshop on Space Operations Applications and Research (SOAR '92)

Bayesian Networks for Probabilistic Inference and Decision Analysis in Forensic Science

Gated Bayesian Networks

Inductive Logic Programming

Risk, Reliability and Safety: Innovating Theory and Practice

"During the last decades Computational Intelligence has emerged and showed its contributions in various broad research communities (computer science, engineering, finance, economic, decision making, etc.). This was done by proposing approaches and algorithms based either on turnkey techniques belonging to the large panoply of solutions offered by computational intelligence such as data mining, genetic algorithms, bio-inspired methods, Bayesian networks, machine learning, fuzzy logic, artificial neural networks, etc. or inspired by computational intelligence techniques to develop new ad-hoc algorithms for the problem under consideration. This volume is a comprehensive collection of extended contributions from the 4th International Conference on Computer Science and Its Applications (CIIA'2013) organized into four main tracks: Track 1: Computational Intelligence, Track 2: Security & Network Technologies, Track 3: Information Technology and Track 4: Computer Systems and Applications. This book presents recent advances in the use and exploitation of computational intelligence in several real world hard problems covering these tracks such as image processing, Arab text processing, sensor and mobile networks, physical design of advanced databases, model matching, etc. that require advanced approaches and algorithms borrowed from computational intelligence for solving them.

This book presents new research studies dealing with the attempts made by the scientists and practitioners to address some key engineering issues in tunneling engineering, geotechnical engineering, and municipal sustainability issues that are becoming quite relevant in today's world. With high urbanization rates, advancement in technologies, difficulties in construction of subway tunnel in soft marine clay deposits, and severe ground subsidence due to excessive groundwater withdrawal pose many challenges in their management. Papers were selected from the 5th GeoChina International Conference 2018 – Civil Infrastructures Confronting Severe Weathers and Climate Changes: From Failure to Sustainability, held on July 23 to 25, 2018 in HangZhou, China.

Master probabilistic graphical models by learning through real-world problems and illustrative code examples in Python About This Book Gain in-depth knowledge of Probabilistic Graphical Models Model time-series problems using Dynamic Bayesian Networks A practical guide to help you apply PGMs to real-world problems Who This Book Is For If you are a researcher or a machine learning enthusiast, or are working in the data science field and have a basic idea of Bayesian Learning or Probabilistic Graphical Models, this book will help you to understand the details of Graphical Models and use it in your data science problems. This book will also help you select the appropriate model as well as the appropriate algorithm for your problem. What You Will Learn Get to know the basics of Probability theory and Graph Theory Work with Markov Networks Implement Bayesian Networks Exact Inference Techniques in Graphical Models such as the Variable Elimination Algorithm Understand approximate Inference Techniques in Graphical Models such as Message Passing Algorithms Sample algorithms in Graphical Models Grasp details of Naive Bayes with real-world examples Deploy PGMs using various libraries in Python Gain working details of Hidden Markov Models with real-world examples In Detail Probabilistic Graphical Models is a technique in machine learning that uses the concepts of graph theory to compactly represent and optimally predict values in our data problems. In real world problems, it's often difficult to select the appropriate graphical model as well as the appropriate inference algorithm, which can make a huge difference in computation time and accuracy. Thus, it is crucial to know the working details of these algorithms. This book starts with the basics of probability theory and graph theory, then goes on to discuss various models and inference algorithms. All the different types of models are discussed along with code examples to create and modify them, and also to run different inference algorithms on them. There is a complete chapter devoted to the most widely used networks Naive Bayes Model and Hidden Markov Models (HMMs). These models have been thoroughly discussed using real-world examples. Style and approach An easy-to-follow guide to help you understand Probabilistic Graphical Models using simple examples and numerous code examples, with an emphasis on more widely used models.

Why is understanding causation so important in philosophy and the sciences? Should causation be defined in terms of probability? Whilst causation plays a major role in theories and concepts of medicine, little attempt has been made to connect causation and probability with medicine itself. Causality, Probability, and Medicine is one of the first books to apply philosophical reasoning about causality to important topics and debates in medicine. Donald Gillies provides a thorough introduction to and assessment of competing theories of causality in philosophy, including action-related theories, causality and mechanisms, and causality and probability. Throughout the book he applies them to important discoveries and theories within medicine, such as germ theory; tuberculosis and cholera; smoking and heart disease; the first ever randomized controlled trial designed to test the treatment of tuberculosis; the growing area of philosophy of evidence-based medicine; and philosophy of epidemiology. This book will be of great interest to students and researchers in philosophy of science and philosophy of medicine, as well as those working in medicine, nursing and related health disciplines where a working knowledge of causality and probability is required.

17th International Conference, ILP 2007, Corvallis, OR, USA, June 19-21, 2007, Revised Selected Papers

The Semantic Web – ISWC 2005

Expert Systems in Chemistry Research

The MIT Encyclopedia of the Cognitive Sciences (MITECS)

MACHINE LEARNING

With Examples in R

Bayesian Networks "This book should have a place on the bookshelf of every forensic scientist who cares about the science of evidence interpretation." Dr. Ian Evett, Principal Forensic Services Ltd, London, UK Bayesian Networks for Probabilistic Inference and Decision Analysis in Forensic Science Second Edition Continuing developments in science and technology mean that the amounts of information forensic scientists are able to provide for criminal investigations is ever increasing. The commensurate increase in complexity creates difficulties for scientists and lawyers with regard to evaluation and interpretation, notably with respect to issues of inference and decision. Probability theory, implemented through graphical methods, and specifically Bayesian networks, provides powerful methods to deal with this complexity. Extensions of these methods to elements of decision theory provide further support and assistance to the judicial system. Bayesian Networks for Probabilistic Inference and Decision Analysis in Forensic Science provides a unique and comprehensive introduction to the use of Bayesian decision networks for the evaluation and interpretation of scientific findings in forensic science, and for the support of decision-makers in their scientific and legal tasks. Includes self-contained introductions to probability and decision theory. Develops the characteristics of Bayesian networks, object-oriented Bayesian networks and their extension to decision models. Features implementation of the methodology with reference to commercial and academically available software. Presents standard networks and their extensions that can be easily implemented and that can assist in the reader's own analysis of real cases. Provides a technique for structuring problems and organizing data based on methods and principles of scientific reasoning. Contains a method for the construction of coherent and defensible arguments for the analysis and evaluation of scientific findings and for decisions based on them. Is written in a lucid style, suitable for forensic scientists and lawyers with minimal mathematical background. Includes a foreword by Ian Evett. The clear and accessible style of this second edition makes this book ideal for all forensic scientists, applied statisticians and graduate students wishing to evaluate forensic findings from the perspective of probability and decision analysis. It will also appeal to lawyers and other scientists and professionals interested in the evaluation and interpretation of forensic findings, including decision making based on scientific information.

Bayesian nets are used in artificial intelligence as a calculus for causal reasoning, enabling machines to make predictions, perform diagnoses, take decisions and even to discover causal relationships. This book brings together how to automate reasoning in artificial intelligence, and the nature of causality and probability in philosophy.

Inspired by the Darwinian framework of evolution through natural selection and adaptation, the field of evolutionary computation has been growing very rapidly, and is today involved in many diverse application areas. This book covers the latest advances in the theories, algorithms, and applications of simulated evolution and learning techniques. It provides insights into different evolutionary computation techniques and their applications in domains such as scheduling, control and power, robotics, signal processing, and bioinformatics. The book will be of significant value to all postgraduates, research scientists and practitioners dealing with evolutionary computation or complex real-world problems.This book has been selected for coverage in:• Index to Scientific & Technical Proceedings (ISTP CDROM version / ISI Proceedings)• CC Proceedings — Engineering & Physical Sciences

Attribute defects cause a majority of the scrap for many manufacturers injection-molding aesthetic parts, yet these defects receive little attention during product development. Methods for preventing attribute defects have been hampered by the inability to quantify complex cause-effect relationships. However, the qualities of a burgeoning branch of knowledge-based systems, called Bayesian networks, have benefited various fields faced with similar circumstances. Bayesian networks have the capability of presenting causal relationships between variables in a graphical structure and quantitatively explaining their effects throughout that structure. These effects can be characterized by probabilities derived from sources, such as equations, historical data, rules-of-thumb or expert knowledge. Thus, a Bayesian network was selected to model the decisions and uncertainty involved in preventing shear splay in polypropylene products. Shear splay is an attribute defect that occurs when shear generated during processing causes the polymer to degrade and release volatiles, which appear as silvery streaks on a part's surface. The shear splay network consisted of 37 variables from areas of materials, part and mold design and processing. A computer-based system was created to elicit 296 subjective probabilities from 25 experts in the field of plastics. A user interface based on past research was designed to interact with experts to efficiently provide relatively unbiased and consistent probabilities. A bootstrap method using trimmed means of their responses was employed to develop a statistic for the probabilities, make inferences about the sample and assess the variability. Interpolation and modified shear rate equations were used to calculate the remaining probabilities. Both the qualitative and quantitative aspects of the network were evaluated by introducing evidence to validate relationships, comparing data of existing products against actual results and allowing several experts to review the model first-hand. Overall, the network performed as expected. It displayed the ability to be used as a decision-support system in preventing shear splay and explained cause-effect relationships that until now have never been quantified. In addition, the elicitation software and method for analyzing response data showed potential for becoming a standard in building Bayesian networks.

33rd Annual German Conference on AI, Karlsruhe, Germany, September 21-24, 2010, Proceedings

Proceedings of the 5th GeoChina International Conference 2018 – Civil Infrastructures Confronting Severe Weathers and Climate Changes: From Failure to Sustainability, held on July 23 to 25, 2018 in HangZhou, China

with Applications in Systems Biology

Second International Conference, SUM 2008, Naples, Italy, October 1-3, 2008, Proceedings

On the Move to Meaningful Internet Systems 2007: CoopIS, DOA, ODBASE, GADA, and IS

Causality

"This book provides an excellent, well-balanced collection of areas where Bayesian networks have been successfully applied; it describes the underlying concepts of Bayesian Networks with the help of diverse applications, and theories that prove Bayesian networks valid"--Provided by publisher.

Bayesian Networks in R with Applications in Systems Biology is unique as it introduces the reader to the essential concepts in Bayesian network modeling and inference in conjunction with examples in the open-source statistical environment R. The level of sophistication is also gradually increased across the chapters with exercises and solutions for enhanced understanding for hands-on experimentation of the theory and concepts. The application focuses on systems biology with emphasis on modeling pathways and signaling mechanisms from high-throughput molecular data. Bayesian networks have proven to be especially useful abstractions in this regard. Their usefulness is especially exemplified by their ability to discover new associations in addition to validating known ones across the molecules of interest. It is also expected that the prevalence of publicly available high-throughput biological data sets may encourage the audience to explore investigating novel paradigms using the approaches presented in the book.

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

The present book is primarily intended for undergraduate and postgraduate students of computer science and engineering, information technology, and electrical and electronics engineering. It bridges the gaps in knowledge of the seemingly difficult areas of machine learning and nature inspired computing. The text is written in a highly interactive manner, which satisfies the learning curiosity of any reader. Content of the text has been diligently organized to offer seamless learning experience. The text begins with introduction to machine learning, which is followed by explanation of different aspects of machine learning. Various supervised, unsupervised, reinforced and nature inspired learning techniques are

included in the text book with numerous examples and case studies. Different aspects of new machine learning and nature inspired learning algorithms are explained in-depth. The well-explained algorithms and pseudo codes for each topic make this book useful for students. The book also throws light on areas like prediction and classification systems. Key Features • Day to day examples and pictorial representations for deeper understanding of the subject • Helps readers easily create programs/applications • Research oriented approach • More case studies and worked-out examples for each machine learning algorithm than any other book

COMPUTATIONAL INTELLIGENCE IN COMPLEX DECISION MAKING SYSTEMS

Bayesian Networks

Transportation Systems and Engineering: Concepts, Methodologies, Tools, and Applications

Proceedings of ESREL 2016 (Glasgow, Scotland, 25-29 September 2016)

Recent Advances In Simulated Evolution And Learning

The Blackwell Guide to the Philosophy of Computing and Information

For this book, the editors invited and called for contributions from indispensable research areas relevant to "chance discovery," which has been defined as the discovery of events significant for making a decision, and studied since 2000. From respective research areas as artificial intelligence, mathematics, cognitive science, medical science, risk management, methodologies for design and communication, the invited and selected authors in this book present their particular approaches to chance discovery. The chapters here show contributions to identifying rare or hidden events and explaining their significance, predicting future trends, communications for scenario development in marketing and design, identification effects and side-effects of medicines, etc. The methods presented in this book are based on the interaction of human, machine, and human's living environment, rather than based purely automated predictions of the future. This is a promising direction of computer-supported decision of human in a radically changing environment.

Originally,managinguncertainty and inconsistencyhas especiallybeen explored in the ?eld of arti?cial intelligence. During recent years, particularly with the availabilityofmassiveamountsofdataindi?erentrepositoriesandthepossibility of integrating and exploiting these data, technologies for managing uncertainty andinconsistencyhavestartedtoplayakeyroleindatabasesandtheWeb.Some of the most prominent of these technologies are probably the ranking algorithms behind Web search engines. Techniques for handling uncertainty and incons- tency are expected to play a similarly important role in the Semantic Web. The annual International Conference on Scalable Uncertainty Management (SUM) hasgrownout ofthisverylargeinterestonmanaginguncertaintyand- consistency in databases,the Web, the Semantic Web, and arti?cial intelligence. Theconferenceaimsat bringingtogether allthoseinterestedin the management of large volumes of uncertainty and inconsistency in these areas. The First - ternational Conference on Scalable Uncertainty Management (SUM 2007) was held in Washington DC, USA, October 10–12, 2007. This volume contains the papers presented at the Second International C- ference on Scalable Uncertainty Management (SUM 2008), which was held in Naples, Italy, October 1–3, 2008. It contains 27 technical papers, which were selected out of 42 submitted papers in a rigorous reviewing process, where each paper wasreviewedby at leastthree ProgramCommittee members.The volume also contains extended abstracts of the three invited tutorials/talks.

In the past half century, we have experienced two major waves of methodological development in the study of human behavior in space and time. The first wave was the well known "quantitative revolution" which propelled geography from a mainly descriptive discipline to a scientific discipline using formalism such as probability, statistics, and a large-number of mathematical methods for analyzing spatial structures and processes under certainty and uncertainty. The second wave is the recent advancement of geographical information systems which equips geographers with automation in the storage, retrieval, analysis, and display of data. Both developments have significant impacts on geographical studies in general and solutions to real life spatio-temporal problems in particular. They have found applications in urban and regional planning, automated mapping and facilities management, transportation planning and management, as well as environmental planning and management, to name but a few examples. Both developments have one thing in common. They one way or the other use computer to process and analyze data. However, not until recently, there has been very little interaction between the two. Quantitative models have largely been developed independent of the underlying data models and structures representing the spatial phenomena or processes under study. Display of analysis results has been primitive in terms of the utilization of computer graphic technologies. Formal models, in addition to their technical difficulties, have poor capability in communication with users. Geographical information systems, on the other hand, have originally been developed with a slight intention to entertain powerful analytical models.

In recent years, there has been a growing interest in the need for designing intelligent systems to address complex decision systems. One of the most challenging issues for the intelligent system is to effectively handle real-world uncertainties that cannot be eliminated. These uncertainties include various types of information that are incomplete, imprecise, fragmentary, not fully reliable, vague, contradictory, deficient, and overloading. The uncertainties result in a lack of the full and precise knowledge of the decision system, including the determining and selection of evaluation criteria, alternatives, weights, assignment scores, and the final integrated decision result. Computational intelligent techniques (including fuzzy logic, neural networks, and genetic algorithms etc.), which are complimentary to the existing traditional techniques, have shown great potential to solve these demanding, real-world decision problems that exist in uncertain and unpredictable environments. These technologies have formed the foundation for intelligent systems.

Theories, Concepts, and Methodologies

Mastering Probabilistic Graphical Models Using Python

Expert Systems and Probabilistic Network Models

Bayesian Philosophy of Science

KI 2010: Advances in Artificial Intelligence

Soft Computing in Ontologies and Semantic Web

`This book covers in a great depth the fast growing topic of tools, techniques and applications of soft computing (e.g., fuzzy logic, genetic algorithms, neural networks, rough sets, Bayesian networks, and other probabilistic techniques) in the ontologies and the Semantic Web. The author shows how components of the Semantic Web (like the RDF, Description Logics, ontologies) can be covered with a soft computing methodology.`

`The papers in this volume are the refereed technical papers presented at AI-2006, the Twenty-sixth SGAI International Conference on Innovative Techniques and Applications of Artificial Intelligence, held in Cambridge in December 2006. They present new and innovative developments in the field. For the first time the volume also includes the text of short papers presented as posters at the conference.`

`Expert systems allow scientists to access, manage, and apply data and specialized knowledge from various disciplines to their own research. Expert Systems in Chemistry Research explains the general scientific basis and computational principles behind expert systems and demonstrates how they can improve the efficiency of scientific workflows and support decision-making processes. Focused initially on clarifying the fundamental concepts, limits, and drawbacks of using computer software to approach human decision making, the author also underscores the importance of putting theory into practice. The book highlights current capabilities for planning and monitoring experiments, scientific data management and interpretation, chemical characterization, problem solving, and methods for encoding chemical data. It also examines the challenges as well as requirements, strategies, and considerations for implementing expert systems effectively in an existing laboratory software environment. Expert Systems in Chemistry Research covers various artificial intelligence technologies used to support expert systems, including nonlinear statistics, wavelet transforms, artificial neural networks, genetic algorithms, and fuzzy logic. This definitive text provides researchers, scientists, and engineers with a cornerstone resource for developing new applications in chemoinformatics, systems design, and other emerging fields.`

`From driverless cars to vehicular networks, recent technological advances are being employed to increase road safety and improve driver satisfaction. As with any newly developed technology, researchers must take care to address all concerns, limitations, and dangers before widespread public adoption. Transportation Systems and Engineering: Concepts, Methodologies, Tools, and Applications addresses current trends in transportation technologies, such as smart cars, green technologies, and infrastructure development. This multivolume book is a critical reference source for engineers, computer scientists, transportation authorities, students, and practitioners in the field of transportation systems management.`

`Data-based Interaction of Human Intelligence and Artificial Intelligence`

`Bayesian Networks in R`

`4th International Semantic Web Conference, ISWC 2005, Galway, Ireland, November 6-10, 2005, Proceedings`

`Sensor Management in ISR`

`Encyclopedia of Information Science and Technology, Third Edition`

`Bayesian Network Technologies: Applications and Graphical Models`

The articles in this volume deal with the main inferential methods that can be applied to different kinds of experimental evidence. These contributions - accompanied with critical comments - by renowned scholars in the field of philosophy of science aim at removing the traditional opposition between inductivists and deductivists. They explore the different methods of explanation and justification in the sciences in different contexts and with different objectives. The volume contains contributions on methods of the sciences, especially on induction, deduction, abduction, laws, probability and explanation, ranging from logic, mathematics, natural to the social sciences. They present a highly topical pluralist re-evaluation of methodological and foundational procedures and reasoning, e.g. focusing in Bayesianism and Artificial Intelligence. They document the second international conference in Vienna on "Induction and Deduction in the Sciences" as part of the Scientific Network on "Historical and Contemporary Perspectives of Philosophy of Science in Europe", funded by the European Science Foundation (ESF).

A little over a decade has passed since the release of the ?rst Netscape browser. In 1995,the World Wide Web was viewedlargelyas an academiccuriosity.Now, of course, the Web is an integral part of the fabric of modern society. It is impossible to imagine science, education, commerce, or government functioning without the Web. We take the Web for granted, and often assume that Internet connectivity is guaranteed to all of us as a birthright. Although the Web indeed has become "world wide" and has lost a bit of its original aura as a consequence of its ubiquity, a burgeoning community of researchers and practitioners continues to work toward the next generation of the Web—a Web where information will be stored in a machine-processable form and where intelligent computer-based agents will access and automatically combine myriad services on the Internet of the kind that are now available only to people interacting directly with their Web browsers.

This book contains the post-conference proceedings of the 17th International Conference on Inductive Logic Programming. It covers current topics in inductive logic programming, from theoretical and methodological issues to advanced applications.

As governments around the world seek new and more effective methods of organizing their administrations, electronic government plays an increasingly more important role in governmental success. However, due to hindrances in financial and communication resources, these advantages are often overlooked. E-Government Success Factors and Measures: Theories, Concepts, and Methodologies investigates successful e-government initiatives in a modern technological environment, exploring both benefits and challenges due to various technical, organizational, social, and contextual factors. The book provides academics and professionals with concepts, theories, and current research in the arena of e-government, enabling readers to develop a broader understanding of the measures inherent in successful e-governments on a global scale. This book is part of the Advances in Electronic Government, Digital Divide, and Regional Development series collection.

Decision Support Systems in Product Development

A PRACTITIONER'S APPROACH

E-Government Success Factors and Measures: Theories, Concepts, and Methodologies

A Bayesian Network Approach for Injectioin-molded Products

Advances in Computational Intelligence, Part III

Causality, Probability, and Medicine

`Bayesian Networks: With Examples in R, Second Edition introduces Bayesian networks using a hands-on approach. Simple yet meaningful examples illustrate each step of the modelling process and discuss side by side the underlying theory and its application using R code. The examples start from the simplest notions and gradually increase in complexity. In particular, this new edition contains significant new material on topics from modern machine-learning practice: dynamic networks, networks with heterogeneous variables, and model validation. The first three chapters explain the whole process of Bayesian network modelling, from structure learning to parameter learning to inference. These chapters cover discrete, Gaussian, and conditional Gaussian Bayesian networks. The following two chapters delve into dynamic networks (to model temporal data) and into networks including arbitrary random variables (using Stan). The book then gives a concise but rigorous treatment of the fundamentals of Bayesian networks and offers an introduction to causal Bayesian networks. It also presents an overview of R packages and other software implementing Bayesian networks. The final chapter evaluates two real-world examples: a landmark causal protein-signalling network published in Science and a probabilistic graphical model for predicting the composition of different body parts. Covering theoretical and practical aspects of Bayesian networks, this book provides you with an introductory overview of the field. It gives you a clear, practical understanding of the key points behind this modelling approach and, at the same time, it makes you familiar with the most relevant packages used to implement real-world analyses in R. The examples covered in the book span several application fields, data-driven models and expert systems, probabilistic and causal perspectives, thus giving you a starting point to work in a variety of scenarios. Online supplementary materials include the data sets and the code used in the book, which will all be made available from https://www.bnlearn.com/book-crc-2ed/`

`Since the 1970s the cognitive sciences have offered multidisciplinary ways of understanding the mind and cognition. The MIT Encyclopedia of the Cognitive Sciences (MITECS) is a landmark, comprehensive reference work that represents the methodological and theoretical diversity of this changing field. At the core of the encyclopedia are 471 concise entries, from Acquisition and Adaptationism to Wundt and X-bar Theory. Each article, written by a leading researcher in the field, provides an accessible introduction to an important concept in the cognitive sciences, as well as references or further readings. Six extended essays, which collectively serve as a roadmap to the articles, provide overviews of each of six major areas of cognitive science: Philosophy; Psychology; Neurosciences; Computational Intelligence; Linguistics and Language; and Culture, Cognition, and Evolution. For both students and researchers, MITECS will be an indispensable guide to the current state of the cognitive sciences.`

`"This 10-volume compilation of authoritative, research-based articles contributed by thousands of researchers and experts from all over the world emphasized modern issues and the presentation of potential opportunities, prospective solutions, and future directions in the field of information science and technology"--Provided by publisher.`

`Risk, Reliability and Safety contains papers describing innovations in theory and practice contributed to the scientific programme of the European Safety and Reliability conference (ESREL 2016), held at the University of Strathclyde in Glasgow, Scotland (25–29 September 2016). Authors include scientists, academics, practitioners, regulators and other key individuals with expertise and experience relevant to specific areas. Papers include domain specific applications as well as general modelling methods. Papers cover evaluation of contemporary solutions, exploration of future challenges, and exposition of concepts, methods and processes. Topics include human factors, occupational health and safety, dynamic and systems reliability modelling, maintenance optimisation, uncertainty analysis, resilience assessment, risk and crisis management.`

`Proceedings of AI-2006, the Twenty-sixth SGAI International Conference on Innovative Techniques and Applications of Artificial Intelligence`

`Lecture Notes in Computational Intelligence and Decision Making`

`Applications and Innovations in Intelligent Systems XIV`

`Applications and Graphical Models`

`Intelligent Spatial Decision Support Systems`

`Chance Discoveries in Real World Decision Making`

This Guide provides an ambitious state-of-the-art survey of the fundamental themes, problems, arguments and theories constituting the philosophy of computing. A complete guide to the philosophy of computing and information. Comprises 26 newly-written chapters by leading international experts. Provides a complete, critical introduction to the field. Each chapter combines careful scholarship with an engaging writing style. Includes an exhaustive glossary of technical terms. Ideal as a course text, but also of interest to researchers and general readers.

Artificial intelligence and expert systems have seen a great deal of research in recent years, much of which has been devoted to methods for incorporating uncertainty into models. This book is devoted to providing a thorough and up-to-date survey of this field for researchers and students.

Bayesian networks have grown to become a dominant type of model within the domain of probabilistic graphical models. Not only do they empower users with a graphical means for describing the relationships among random variables, but they also allow for (potentially) fewer parameters to estimate, and enable more efficient inference. The random variables and the relationships among them decide the structure of the directed acyclic graph that represents the Bayesian network. It is the stasis over time of these two components that we question in this thesis. By introducing a new type of probabilistic graphical model, which we call gated Bayesian networks, we allow for the variables that we include in our model, and the relationships among them, to change over time. We introduce algorithms that can learn gated Bayesian networks that use different variables at different times, required due to the process which we are modelling going through distinct phases. We evaluate the efficacy of these algorithms within the domain of algorithmic trading, showing how the learnt gated Bayesian networks can improve upon a passive approach to trading. We also introduce algorithms that detect changes in the relationships among the random variables, allowing us to create a model that consists of several Bayesian networks, thereby revealing changes and the structure by which these changes occur. The resulting models can be used to detect the currently most appropriate Bayesian network, and we show their use in real-world examples from both the domain of sports analytics and finance.

Bayesian Nets and Causality: Philosophical and Computational Foundations

Tunneling in Soft Ground, Ground Conditioning and Modification Techniques

Scalable Uncertainty Management

Proceedings of the XV International Scientific Conference "Intellectual Systems of Decision Making and Problems of Computational Intelligence" (ISDMCI'2019), Ukraine, May 21-25, 2019

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