

Neural Network Fundamentals With Graphs Algorithms And Applications Mcgraw Hill Series In Electrical Computer Engineering

This book constitutes the refereed proceedings of the 13th International Conference on Scalable Uncertainty Management, SUM 2019, which was held in Compiègne, France, in December 2019. The 25 full, 4 short, 4 tutorial, 2 invited keynote papers presented in this volume were carefully reviewed and selected from 44 submissions. The conference is dedicated to the management of large amounts of complex, uncertain, incomplete, or inconsistent information. New approaches have been developed on imprecise probabilities, fuzzy set theory, rough set theory, ordinal uncertainty representations, or even purely qualitative models.

As technology continues to become more sophisticated, mimicking natural processes and phenomena also becomes more of a reality. Continued research in the field of natural computing enables an understanding of the world around us, in addition to opportunities for man-made computing to mirror the natural processes and systems that have existed for centuries. Nature-Inspired Computing: Concepts, Methodologies, Tools, and Applications takes an interdisciplinary approach to the topic of natural computing, including emerging technologies being developed for the purpose of simulating natural phenomena, applications across industries, and the future outlook of biologically and nature-inspired technologies. Emphasizing critical research in a comprehensive multi-volume set, this publication is designed for use by IT professionals, researchers, and graduate students studying intelligent computing.

A mathematician on par with the greatest in the century, Norbert Wiener was a universal thinker of colossal proportions. This book contains the proceedings of the Norbert Wiener Centenary Congress held at Michigan State University on November 27-December 2, 1994. The aim of the Congress was to reveal the depth and strong coherence of thought that runs through Wiener's legacy, and to exhibit its continuation in on-going research. This volume brings together the great minds who have furthered Wiener's ideas in physics, stochastics, harmonic analysis, philosophy, prosthesis and cybernetics. The presentations coherently lay out the developments of the subjects from their inception. This volume provides an excellent pathway for new investigators who may wish to pursue these developments by following the footsteps of world experts. There is no other book available in which experts in the various fields in which Wiener worked have presented his thoughts and contributions in such a coherent and lucid manner.

This study explores the design and application of natural language text-based processing systems, based on generative linguistics, empirical corpus analysis, and artificial neural networks. It emphasizes the practical tools to accommodate the selected system.

This book presents a systematic approach to understanding and applying the principles of hydrology and hydroclimatology, examining the interactions among different components of the water cycle. It takes a fresh look at the fundamentals and

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challenges in hydrologic and hydroclimatic systems as well as climate change. The author describes the application of nontraditional data sets and new investigation techniques to water-related problems. He also examines long lead forecasting and simulation, time series analysis, and risk and uncertainty in hydrologic design.

This book constitutes the refereed proceedings of the 11th Iberoamerican Congress on Pattern Recognition, CIARP 2006, held in Cancun, Mexico in November 2006. The 99 revised full papers presented together with three keynote articles were carefully reviewed and selected from 239 submissions. The papers cover ongoing research and mathematical methods.

Neural Network Fundamentals with Graphs, Algorithms, and Applications McGraw-Hill College
Neural Network Fundamentals with Graphs, Algorithms, and Applications McGraw-Hill Book Company Limited
Solutions Manual to Accompany Neural Network Fundamentals with Graphs, Algorithms, and Applications
The Electrical Engineering Handbook, Second Edition CRC Press
Designed as an introductory level textbook on Artificial Neural Networks at the postgraduate and senior undergraduate levels in any branch of engineering, this self-contained and well-organized book highlights the need for new models of computing based on the fundamental principles of neural networks. Professor Yegnanarayana compresses, into the covers of a single volume, his several years of rich experience, in teaching and research in the areas of speech processing, image processing, artificial intelligence and neural networks. He gives a masterly analysis of such topics as Basics of artificial neural networks, Functional units of artificial neural networks for pattern recognition tasks, Feedforward and Feedback neural networks, and Architectures for complex pattern recognition tasks. Throughout, the emphasis is on the pattern processing feature of the neural networks. Besides, the presentation of real-world applications provides a practical thrust to the discussion.

This book constitutes the proceedings of the second International Workshop on Advanced Computational Intelligence (IWACI 2009), with a sequel of IWACI 2008 successfully held in Macao, China. IWACI 2009 provided a high-level international forum for scientists, engineers, and educators to present state-of-the-art research in computational intelligence and related fields. Over the past decades, computational intelligence community has witnessed tremendous efforts and developments in all aspects of theoretical foundations, architectures and network organizations, modelling and simulation, empirical study, as well as a wide range of applications across different domains. IWACI 2009 provided a great platform for the community to share their latest research results, discuss critical future research directions, stimulate innovative research ideas, as well as facilitate international multidisciplinary collaborations. IWACI 2009 received 146 submissions from about 373 authors in 26 countries and regions (Australia, Brazil, Canada, China, Chile, Hong Kong, India, Islamic Republic of Iran, Japan, Jordan, Macao, Malaysia, Mexico, Pakistan, Philippines, Qatar, Republic of Korea, Singapore, South Africa, Sri Lanka, Spain, Taiwan, Thailand, UK, USA, Venezuela, Vietnam, and Yemen) across six continents (Asia, Europe, North America, South America, Africa, and Oceania). Based on the rigorous peer reviews by the Program Committee members, 52 high-quality papers were selected for publication in this book, with an acceptance rate of 36.3%. These papers cover major topics of the theoretical research, empirical study, and applications of computational intelligence.

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This concise, readable book provides a sampling of the very large, active, and expanding field of artificial neural network theory. It considers select areas of discrete mathematics linking combinatorics and the theory of the simplest types of artificial neural networks. Neural networks have emerged as a key technology in many fields of application, and an understanding of the theories concerning what such systems can and cannot do is essential.

Pattern recognition is a scientific discipline that is becoming increasingly important in the age of automation and information handling and retrieval. Pattern Recognition, 2e covers the entire spectrum of pattern recognition applications, from image analysis to speech recognition and communications. This book presents cutting-edge material on neural networks, - a set of linked microprocessors that can form associations and uses pattern recognition to "learn" -and enhances student motivation by approaching pattern recognition from the designer's point of view. A direct result of more than 10 years of teaching experience, the text was developed by the authors through use in their own classrooms. *Approaches pattern recognition from the designer's point of view *New edition highlights latest developments in this growing field, including independent components and support vector machines, not available elsewhere *Supplemented by computer examples selected from applications of interest

"Data-Driven Modeling: Using MATLAB® in Water Resources and Environmental Engineering" provides a systematic account of major concepts and methodologies for data-driven models and presents a unified framework that makes the subject more accessible to and applicable for researchers and practitioners. It integrates important theories and applications of data-driven models and uses them to deal with a wide range of problems in the field of water resources and environmental engineering such as hydrological forecasting, flood analysis, water quality monitoring, regionalizing climatic data, and general function approximation. The book presents the statistical-based models including basic statistical analysis, nonparametric and logistic regression methods, time series analysis and modeling, and support vector machines. It also deals with the analysis and modeling based on artificial intelligence techniques including static and dynamic neural networks, statistical neural networks, fuzzy inference systems, and fuzzy regression. The book also discusses hybrid models as well as multi-model data fusion to wrap up the covered models and techniques. The source files of relatively simple and advanced programs demonstrating how to use the models are presented together with practical advice on how to best apply them. The programs, which have been developed using the MATLAB® unified platform, can be found on extras.springer.com. The main audience of this book includes graduate students in water resources engineering, environmental engineering, agricultural engineering, and natural resources engineering. This book may be adapted for use as a senior undergraduate and graduate textbook by focusing on selected topics. Alternatively, it may also be used as a valuable resource book for practicing engineers, consulting engineers, scientists and others involved in water resources and environmental engineering.

Advances in Coastal Hydraulics contains twelve papers that report on recent developments in several areas of coastal hydraulics. The papers, written by well-regarded authors, cover interesting topics such as the interaction of groundwater and coastal waters, the use of remote sensing for coastal applications, erosion in Arctic environments, the impact of marine vegetation on coastal

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hydrodynamics, new methods to examine the reliability of breakwater design, the development of marine kinetic energy, and methods for modeling coastal processes as well as their applications to small and large scales, such as a harbor in Hawaii (for design) and the extensive coast of India (for examining the effects of tsunamis and sea level rise). The developments presented in this book could serve not only as a reference book, but also as a starting point for new endeavors in the respective topics.

Provides a clear, comprehensive introduction to the subject. Different problems of optimization are considered and illustrated with examples. Large sets of new experimental data are presented and discussed.

Edited by a leading expert in the field with contributions from experienced researchers in fibers and textiles, this handbook reviews the current state of fibrous materials and provides a broad overview of their use in research and development. Volume One focuses on the classes of fibers, their production and characterization, while the second volume concentrates on their applications, including emerging ones in the areas of energy, environmental science and healthcare. Unparalleled knowledge of high relevance to academia and industry.

This book constitutes the refereed proceedings of the joint International Conference on Artificial Neural Networks and International Conference on Neural Information Processing, ICANN/ICONIP 2003, held in Istanbul, Turkey, in June 2003. The 138 revised full papers were carefully reviewed and selected from 346 submissions. The papers are organized in topical sections on learning algorithms, support vector machine and kernel methods, statistical data analysis, pattern recognition, vision, speech recognition, robotics and control, signal processing, time-series prediction, intelligent systems, neural network hardware, cognitive science, computational neuroscience, context aware systems, complex-valued neural networks, emotion recognition, and applications in bioinformatics.

The book provides a platform for dealing with the flaws and failings of the soft computing paradigm through different manifestations. The different chapters highlight the necessity of the hybrid soft computing methodology in general with emphasis on several application perspectives in particular. Typical examples include (a) Study of Economic Load Dispatch by Various Hybrid Optimization Techniques, (b) An Application of Color Magnetic Resonance Brain Image Segmentation by Para Optimus LG Activation Function, (c) Hybrid Rough-PSO Approach in Remote Sensing Imagery Analysis, (d) A Study and Analysis of Hybrid Intelligent Techniques for Breast Cancer Detection using Breast Thermograms, and (e) Hybridization of 2D-3D Images for Human Face Recognition. The elaborate findings of the chapters enhance the exhibition of the hybrid soft computing paradigm in the field of intelligent computing.

As science continues to advance, researchers are continually gaining new insights into the way living beings behave and function, and into the composition of the smallest molecules. Most of these biological processes have been imitated by many scientific disciplines with the purpose of trying to solve different problems, one of which is artificial intelligence. Advancing Artificial Intelligence through Biological Process Applications presents recent advances in the study of certain biological processes related to information processing that are applied to artificial intelligence. Describing the benefits of recently discovered and existing

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techniques to adaptive artificial intelligence and biology, this book will be a highly valued addition to libraries in the neuroscience, molecular biology, and behavioral science spheres.

Artificial Intelligence is concerned with producing devices that help or replace human beings in their daily activities. Neural-symbolic learning systems play a central role in this task by combining, and trying to benefit from, the advantages of both the neural and symbolic paradigms of artificial intelligence. This book provides a comprehensive introduction to the field of neural-symbolic learning systems, and an invaluable overview of the latest research issues in this area. It is divided into three sections, covering the main topics of neural-symbolic integration - theoretical advances in knowledge representation and learning, knowledge extraction from trained neural networks, and inconsistency handling in neural-symbolic systems. Each section provides a balance of theory and practice, giving the results of applications using real-world problems in areas such as DNA sequence analysis, power systems fault diagnosis, and software requirements specifications. Neural-Symbolic Learning Systems will be invaluable reading for researchers and graduate students in Engineering, Computing Science, Artificial Intelligence, Machine Learning and Neurocomputing. It will also be of interest to Intelligent Systems practitioners and anyone interested in applications of hybrid artificial intelligence systems.

In 1993, the first edition of The Electrical Engineering Handbook set a new standard for breadth and depth of coverage in an engineering reference work. Now, this classic has been substantially revised and updated to include the latest information on all the important topics in electrical engineering today. Every electrical engineer should have an opportunity to expand his expertise with this definitive guide. In a single volume, this handbook provides a complete reference to answer the questions encountered by practicing engineers in industry, government, or academia. This well-organized book is divided into 12 major sections that encompass the entire field of electrical engineering, including circuits, signal processing, electronics, electromagnetics, electrical effects and devices, and energy, and the emerging trends in the fields of communications, digital devices, computer engineering, systems, and biomedical engineering. A compendium of physical, chemical, material, and mathematical data completes this comprehensive resource. Every major topic is thoroughly covered and every important concept is defined, described, and illustrated. Conceptually challenging but carefully explained articles are equally valuable to the practicing engineer, researchers, and students. A distinguished advisory board and contributors including many of the leading authors, professors, and researchers in the field today assist noted author and professor Richard Dorf in offering complete coverage of this rapidly expanding field. No other single volume available today offers this combination of broad coverage and depth of exploration of the topics. The Electrical Engineering Handbook will be an invaluable resource for electrical engineers for years to come.

This book constitutes the refereed proceedings of the 13th Biennial Conference of the Canadian Society for Computational Studies of Intelligence, AI 2000, held in Montreal, Quebec, Canada, in May 2000. The 25 revised full papers presented together with 12 10-page posters were carefully reviewed and selected from more than 70 submissions. The papers are organized in topical sections on games and constraint satisfaction; natural language processing; knowledge representation; AI applications; machine

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learning and data mining; planning, theorem proving, and artificial life; and neural networks.

Evolutionary Learning Algorithms for Neural Adaptive Control is an advanced textbook, which investigates how neural networks and genetic algorithms can be applied to difficult adaptive control problems which conventional results are either unable to solve, or for which they can not provide satisfactory results. It focuses on the principles involved, rather than on the modelling of the applications themselves, and therefore provides the reader with a good introduction to the fundamental issues involved.

In recent years machine learning has made its way from artificial intelligence into areas of administration, commerce, and industry. Data mining is perhaps the most widely known demonstration of this migration, complemented by less publicized applications of machine learning like adaptive systems in industry, financial prediction, medical diagnosis and the construction of user profiles for Web browsers. This book presents the capabilities of machine learning methods and ideas on how these methods could be used to solve real-world problems. The first ten chapters assess the current state of the art of machine learning, from symbolic concept learning and conceptual clustering to case-based reasoning, neural networks, and genetic algorithms. The second part introduces the reader to innovative applications of ML techniques in fields such as data mining, knowledge discovery, human language technology, user modeling, data analysis, discovery science, agent technology, finance, etc.

Any task that involves decision-making can benefit from soft computing techniques which allow premature decisions to be deferred. The processing and analysis of images is no exception to this rule. In the classical image analysis paradigm, the first step is nearly always some sort of segmentation process in which the image is divided into (hopefully, meaningful) parts. It was pointed out nearly 30 years ago by Prewitt [1] that the decisions involved in image segmentation could be postponed by regarding the image parts as fuzzy, rather than crisp, subsets of the image. It was also realized very early that many basic properties of and operations on image subsets could be extended to fuzzy subsets; for example, the classic paper on fuzzy sets by Zadeh [2] discussed the "set algebra" of fuzzy sets (using sup for union and inf for intersection), and extended the definition of convexity to fuzzy sets. These and similar ideas allowed many of the methods of image analysis to be generalized to fuzzy image parts. For a recent review on geometric description of fuzzy sets see, e. g., [3]. Fuzzy methods are also valuable in image processing and coding, where learning processes can be important in choosing the parameters of filters, quantizers, etc.

We welcomed participants to the 1st EurAsian Conference on Advances in Information and Communication Technology (EurAsia ICT 2002) held in Iran. The aim of the conference was to serve as a forum to bring together researchers from academia and commercial developers from industry to discuss the current state of the art in ICT, mainly in Europe and Asia. Inspirations and new ideas were expected to emerge from intensive discussions during formal sessions and social events. Keynote addresses, research presentation, and discussion during the conference helped to further develop the exchange of ideas among the researchers, developers, and practitioners who attended. The conference attracted more than 300 submissions and each paper was reviewed by at least three program committee members. The program committee selected 119 papers from authors of 30 different countries for presentation and publication, a task which was not easy due to the high quality of the submitted papers. Eleven workshops were organized in parallel with the EurAsia ICT conference. The proceedings of these workshops, with more than 100 papers, were published by the Austrian Computer Society. We would like to express our thanks to our colleagues who helped with putting together the technical program: the program committee members and external reviewers for their timely

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and rigorous reviews of the papers, and the organizing committee for their help in administrative work and support. We owe special thanks to Thomas Schierer for always being available when his helping hand was needed.

This volume is the first part of the two-volume proceedings of the International Conference on Artificial Neural Networks (ICANN 2005), held on September 11–15, 2005 in Warsaw, Poland, with several accompanying workshops held on September 15, 2005 at the Nicolaus Copernicus University, Toru, Poland. The ICANN conference is an annual meeting organized by the European Neural Network Society in cooperation with the International Neural Network Society, the Japanese Neural Network Society, and the IEEE Computational Intelligence Society. It is the premier European event covering all topics concerned with neural networks and related areas. The ICANN series of conferences was initiated in 1991 and soon became the major European gathering for experts in those fields. In 2005 the ICANN conference was organized by the Systems Research Institute, Polish Academy of Sciences, Warsaw, Poland, and the Nicolaus Copernicus University, Toru, Poland. From over 600 papers submitted to the regular sessions and some 10 special conference sessions, the International Program Committee selected – after a thorough peer-review process – about 270 papers for publication. The large number of papers accepted is certainly a proof of the vitality and attractiveness of the field of artificial neural networks, but it also shows a strong interest in the ICANN conferences.

This six-volume set presents cutting-edge advances and applications of expert systems. Because expert systems combine the expertise of engineers, computer scientists, and computer programmers, each group will benefit from buying this important reference work. An "expert system" is a knowledge-based computer system that emulates the decision-making ability of a human expert. The primary role of the expert system is to perform appropriate functions under the close supervision of the human, whose work is supported by that expert system. In the reverse, this same expert system can monitor and double check the human in the performance of a task. Human-computer interaction in our highly complex world requires the development of a wide array of expert systems. Key Features * Expert systems techniques and applications are presented for a diverse array of topics including: * Experimental design and decision support * The integration of machine learning with knowledge acquisition for the design of expert systems * Process planning in design and manufacturing systems and process control applications * Knowledge discovery in large-scale knowledge bases * Robotic systems * Geographic information systems * Image analysis, recognition and interpretation * Cellular automata methods for pattern recognition * Real-time fault tolerant control systems * CAD-based vision systems in pattern matching processes * Financial systems * Agricultural applications * Medical diagnosis

"Analyzes the behavior, design, and implementation of artificial recurrent neural networks. Offers methods of synthesis for associative memories. Evaluates the qualitative properties and limitations of neural networks. Contains practical applications for optimal system performance."

Discover the benefits of applying algorithms to solve scientific, engineering, and practical problems Providing a combination of theory, algorithms, and simulations, Handbook of Applied Algorithms presents an all-encompassing treatment of applying algorithms and discrete mathematics to practical problems in "hot" application areas, such as computational biology, computational chemistry, wireless networks, and computer vision. In eighteen self-contained chapters, this timely book explores: * Localized algorithms that can be used in topology control for wireless ad-hoc or sensor networks * Bioinformatics algorithms for analyzing data * Clustering algorithms and identification of association rules in data mining * Applications of combinatorial algorithms and graph theory in chemistry and molecular biology * Optimizing the frequency planning of a GSM network using evolutionary algorithms * Algorithmic solutions and advances achieved through game theory Complete with exercises for readers to measure their comprehension of the material presented, Handbook of Applied Algorithms is a much-

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needed resource for researchers, practitioners, and students within computer science, life science, and engineering. Amiya Nayak, PhD, has over seventeen years of industrial experience and is Full Professor at the School of Information Technology and Engineering at the University of Ottawa, Canada. He is on the editorial board of several journals. Dr. Nayak's research interests are in the areas of fault tolerance, distributed systems/algorithms, and mobile ad-hoc networks. Ivan Stojmenović, PhD, is Professor at the University of Ottawa, Canada (www.site.uottawa.ca/~ivan), and Chair Professor of Applied Computing at the University of Birmingham, United Kingdom. Dr. Stojmenović received the Royal Society Wolfson Research Merit Award. His current research interests are mostly in the design and analysis of algorithms for wireless ad-hoc and sensor networks.

The refereed proceedings of the 16th International Conference on Industrial and Engineering Applications of Artificial Intelligence and Expert Systems, IEA/AIE 2003, held in Loughborough, UK, in June 2003. The 81 revised full papers presented were carefully reviewed and selected from more than 140 submissions. Among the topics addressed are soft computing, fuzzy logic, diagnosis, knowledge representation, knowledge management, automated reasoning, machine learning, planning and scheduling, evolutionary computation, computer vision, agent systems, algorithmic learning, tutoring systems, and financial analysis.

Generally speaking, Biosignals refer to signals recorded from the human body. They can be either electrical (e. g. Electrocardiogram (ECG), Electroencephalogram (EEG), Electromyogram (EMG), etc.) or non-electrical (e. g. breathing, movements, etc.). The acquisition and processing of such signals play an important role in clinical routines. They are usually considered as major indicators which provide clinicians and physicians with useful information during diagnostic and monitoring processes. In some applications, the purpose is not necessarily medical. It may also be industrial. For instance, a real-time EEG system analysis can be used to control and analyze the vigilance of a car driver. In this case, the purpose of such a system basically consists of preventing crash risks. Furthermore, in certain other applications, a set of biosignals (e. g. ECG, respiratory signal, EEG, etc.) can be used to control or analyze human emotions. This is the case of the famous polygraph system, also known as the "lie detector", the efficiency of which remains open to debate! Thus when one is dealing with biosignals, special attention must be given to their acquisition, their analysis and their processing capabilities which constitute the final stage preceding the clinical diagnosis. Naturally, the diagnosis is based on the information provided by the processing system.

This book considers classical and current theory and practice, of supervised, unsupervised and semi-supervised pattern recognition, to build a complete background for professionals and students of engineering. The authors, leading experts in the field of pattern recognition, have provided an up-to-date, self-contained volume encapsulating this wide spectrum of information. The very latest methods are incorporated in this edition: semi-supervised learning, combining clustering algorithms, and relevance feedback. · Thoroughly developed to include many more worked examples to give greater understanding of the various methods and techniques · Many more diagrams included--now in two color--to provide greater insight through visual presentation · Matlab code of the most common methods are given at the end of each chapter. · More Matlab code is available, together with an accompanying manual, via this site · Latest hot topics included to further the reference value of the text including non-linear dimensionality reduction techniques, relevance feedback, semi-supervised learning, spectral clustering, combining clustering algorithms. · An accompanying book with Matlab code of the most common methods and algorithms in the book, together with a descriptive summary, and solved examples including real-life data sets in imaging, and audio recognition. The companion book will be available separately or at a special packaged price (ISBN: 9780123744869). Thoroughly developed to include many more worked examples to give greater understanding of the various methods and techniques Many more diagrams included--now in two color--to

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provide greater insight through visual presentation Matlab code of the most common methods are given at the end of each chapter An accompanying book with Matlab code of the most common methods and algorithms in the book, together with a descriptive summary and solved examples, and including real-life data sets in imaging and audio recognition. The companion book is available separately or at a special packaged price (Book ISBN: 9780123744869. Package ISBN: 9780123744913) Latest hot topics included to further the reference value of the text including non-linear dimensionality reduction techniques, relevance feedback, semi-supervised learning, spectral clustering, combining clustering algorithms Solutions manual, powerpoint slides, and additional resources are available to faculty using the text for their course. Register at www.textbooks.elsevier.com and search on "Theodoridis" to access resources for instructor.

As a powerful approach to data reasoning, rough set theory has proven to be invaluable in knowledge acquisition, decision analysis and forecasting, and knowledge discovery. With the ability to enhance the advantages of other soft technology theories, hybrid rough set theory is quickly emerging as a method of choice for decision making under uncertain conditions. Keeping the complicated mathematics to a minimum, Hybrid Rough Sets and Applications in Uncertain Decision-Making provides a systematic introduction to the methods and application of the hybridization for rough set theory with other related soft technology theories, including probability, grey systems, fuzzy sets, and artificial neural networks. It also: Addresses the variety of uncertainties that can arise in the practical application of knowledge representation systems Unveils a novel hybrid model of probability and rough sets Introduces grey variable precision rough set models Analyzes the advantages and disadvantages of various practical applications The authors examine the scope of application of the rough set theory and discuss how the combination of variable precision rough sets and dominance relations can produce probabilistic preference rules out of preference attribute decision tables of preference actions. Complete with numerous cases that illustrate the specific application of hybrid methods, the text adopts the latest achievements in the theory, method, and application of rough sets.

This book provides a step-by-step procedure for formulation and development of Artificial Neural Networks based Vehicular pollution models. It takes into account meteorological and traffic aspects. The book will be useful for professionals and researchers working in problems associated with urban air pollution management and control

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