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ARTIFICIAL NEURAL NETWORKS IN REAL-LIFE APPLICATIONS

IGI Global **"This book offers an outlook of the most recent works at the field of the Artificial Neural Networks (ANN), including theoretical developments and applications of systems using intelligent characteristics for adaptability"-- Provided by publisher.**

ARTIFICIAL NEURAL NETWORKS FOR RENEWABLE ENERGY SYSTEMS AND REAL-WORLD APPLICATIONS

Academic Press **Artificial Neural Networks for Renewable Energy Systems and Real-World Applications presents current trends for the solution of complex engineering problems in the application, modeling, analysis, and optimization of different energy systems and manufacturing processes. With growing research catering to the applications of neural networks in specific industrial applications, this reference provides a single resource catering to a broader perspective of ANN in renewable energy systems and manufacturing processes. ANN-based methods have attracted the attention of scientists and researchers in different engineering and industrial disciplines, making this book a useful reference for all researchers and engineers interested in artificial networks, renewable energy systems, and manufacturing process analysis. Includes illustrative examples on the design and development of ANNS for renewable and manufacturing applications Features computer-aided simulations presented as algorithms, pseudocodes and flowcharts Covers ANN theory for easy reference in subsequent technology specific sections**

APPLICATIONS OF NEURAL NETWORKS

Springer Science & Business Media **Applications of Neural Networks gives a detailed description of 13 practical applications of neural networks, selected because the tasks performed by the neural networks are real and significant. The contributions are from leading researchers in neural networks and, as a whole, provide a balanced coverage across a range of application areas and algorithms. The book is divided into three sections. Section A is an introduction to neural networks for nonspecialists. Section B looks at examples of applications using `Supervised Training'. Section C presents a number of examples of `Unsupervised Training'. For neural network enthusiasts and interested, open-minded sceptics. The book leads the latter through the fundamentals into a convincing and varied series of neural success stories -- described carefully and honestly without over-claiming. Applications of Neural Networks is essential reading for all researchers and designers who are tasked with using neural networks in real life applications.**

APPLICATIONS OF ARTIFICIAL NEURAL NETWORKS FOR NONLINEAR DATA

IGI Global **Processing information and analyzing data efficiently and effectively is crucial for any company that wishes to stay competitive in its respective market. Nonlinear data presents new challenges to organizations, however, due to its complexity and unpredictability. The only technology that can properly handle this form of data is artificial neural networks. These modeling systems present a high level of benefits in analyzing complex data in a proficient manner, yet considerable research on the specific applications of these intelligent components is significantly deficient. Applications of Artificial Neural Networks for Nonlinear Data is a collection of innovative research on the contemporary nature of artificial neural networks and their specific implementations within data analysis. While highlighting topics including propagation functions, optimization techniques, and learning methodologies, this book is ideally designed for researchers, statisticians, academicians, developers, scientists, practitioners, students, and educators seeking current research on the use of artificial neural networks in diagnosing and solving nonparametric problems.**

ARTIFICIAL NEURAL NETWORKS FOR ENGINEERING APPLICATIONS

Academic Press **Artificial Neural Networks for Engineering Applications presents current trends for the solution of complex engineering problems that cannot be solved through conventional methods. The proposed methodologies can be applied to modeling, pattern recognition, classification, forecasting, estimation, and more. Readers will find different methodologies to solve various problems, including complex nonlinear systems, cellular computational networks, waste water treatment, attack detection on cyber-physical systems, control of UAVs, biomechanical and biomedical systems, time series forecasting, biofuels, and more. Besides the real-time implementations, the book contains all the theory required to use the proposed methodologies for different applications. Presents the current trends for the solution of complex engineering problems that cannot be solved through conventional methods Includes**

real-life scenarios where a wide range of artificial neural network architectures can be used to solve the problems encountered in engineering Contains all the theory required to use the proposed methodologies for different applications

RESEARCH ANTHOLOGY ON ARTIFICIAL NEURAL NETWORK APPLICATIONS

IGI Global **Artificial neural networks (ANNs) present many benefits in analyzing complex data in a proficient manner. As an effective and efficient problem-solving method, ANNs are incredibly useful in many different fields. From education to medicine and banking to engineering, artificial neural networks are a growing phenomenon as more realize the plethora of uses and benefits they provide. Due to their complexity, it is vital for researchers to understand ANN capabilities in various fields. The Research Anthology on Artificial Neural Network Applications covers critical topics related to artificial neural networks and their multitude of applications in a number of diverse areas including medicine, finance, operations research, business, social media, security, and more. Covering everything from the applications and uses of artificial neural networks to deep learning and non-linear problems, this book is ideal for computer scientists, IT specialists, data scientists, technologists, business owners, engineers, government agencies, researchers, academicians, and students, as well as anyone who is interested in learning more about how artificial neural networks can be used across a wide range of fields.**

NEURAL NETWORKS

METHODOLOGY AND APPLICATIONS

Springer Science & Business Media **Neural networks represent a powerful data processing technique that has reached maturity and broad application. When clearly understood and appropriately used, they are a mandatory component in the toolbox of any engineer who wants make the best use of the available data, in order to build models, make predictions, mine data, recognize shapes or signals, etc. Ranging from theoretical foundations to real-life applications, this book is intended to provide engineers and researchers with clear methodologies for taking advantage of neural networks in industrial, financial or banking applications, many instances of which are presented in the book. For the benefit of readers wishing to gain deeper knowledge of the topics, the book features appendices that provide theoretical details for greater insight, and algorithmic details for efficient programming and implementation. The chapters have been written by experts and edited to present a coherent and comprehensive, yet not redundant, practically oriented introduction.**

SOFT COMPUTING MODELS IN INDUSTRIAL AND ENVIRONMENTAL APPLICATIONS, 6TH INTERNATIONAL CONFERENCE SOCO 2011

Springer Science & Business Media **This volume of Advances in Intelligent and Soft Computing contains accepted papers presented at SOCO 2011 held in the beautiful and historic city of Salamanca, Spain, April 2011. This volume presents the papers accepted for the 2011 edition, both for the main event and the Special Sessions. SOCO 2011 Special Sessions are a very useful tool in order to complement the regular program with new or emerging topics of particular interest to the participating community. Four special sessions were organized related to relevant topics as: Optimization and Control in Industry, Speech Processing and Soft Computing, Systems, Man & Cybernetics and Soft Computing for Medical Applications.**

FOOD ENGINEERING - VOLUME IV

EOLSS Publications **Food Engineering is a component of Encyclopedia of Food and Agricultural Sciences, Engineering and Technology Resources in the global Encyclopedia of Life Support Systems (EOLSS), which is an integrated compendium of twenty one Encyclopedias. Food Engineering became an academic discipline in the 1950s. Today it is a professional and scientific multidisciplinary field related to food manufacturing and the practical applications of food science. These volumes cover five main topics: Engineering Properties of Foods; Thermodynamics in Food Engineering; Food Rheology and Texture; Food Process Engineering; Food Plant Design, which are then expanded into multiple subtopics, each as a chapter. These four volumes are aimed at the following five major target audiences: University and College students Educators, Professional practitioners, Research personnel and Policy analysts, managers, and decision makers and NGOs**

DEEP LEARNING AND NEURAL NETWORKS: CONCEPTS, METHODOLOGIES, TOOLS, AND APPLICATIONS

CONCEPTS, METHODOLOGIES, TOOLS, AND APPLICATIONS

IGI Global **Due to the growing use of web applications and communication devices, the use of data has increased throughout various industries. It is necessary to develop new techniques for managing data in order to ensure adequate usage. Deep learning, a subset of artificial intelligence and machine learning, has been recognized in various real-world applications such as computer vision, image processing, and pattern recognition. The deep learning approach has opened new opportunities that can make such real-life applications and tasks easier and more efficient. Deep Learning and Neural Networks: Concepts, Methodologies, Tools, and Applications is a vital reference source that trends in data analytics and potential technologies that will facilitate insight in various domains of science, industry, business, and consumer applications. It also explores the latest concepts, algorithms, and techniques of deep learning and data mining and analysis. Highlighting a range of topics such as natural language processing, predictive analytics,**

and deep neural networks, this multi-volume book is ideally designed for computer engineers, software developers, IT professionals, academicians, researchers, and upper-level students seeking current research on the latest trends in the field of deep learning.

STABILITY ANALYSIS OF NEURAL NETWORKS

Springer Nature **This book discusses recent research on the stability of various neural networks with constrained signals. It investigates stability problems for delayed dynamical systems where the main purpose of the research is to reduce the conservativeness of the stability criteria. The book mainly focuses on the qualitative stability analysis of continuous-time as well as discrete-time neural networks with delays by presenting the theoretical development and real-life applications in these research areas. The discussed stability concept is in the sense of Lyapunov, and, naturally, the proof method is based on the Lyapunov stability theory. The present book will serve as a guide to enable the reader in pursuing the study of further topics in greater depth and is a valuable reference for young researcher and scientists.**

HIGH PERFORMANCE ARCHITECTURE AND GRID COMPUTING

INTERNATIONAL CONFERENCE, HPAGC 2011, CHANDIGARH, INDIA, JULY 19-20, 2011. PROCEEDINGS

Springer Science & Business Media **This book constitutes the refereeds proceedings of the International Conference on High Performance Architecture and Grid Computing, HPAGC 2011, held in Chandigarh, India, in July 2011. The 87 revised full papers presented were carefully reviewed and selected from 240 submissions. The papers are organized in topical sections on grid and cloud computing; high performance architecture; information management and network security.**

ADVANCES IN SECURE COMPUTING, INTERNET SERVICES, AND APPLICATIONS

IGI Global **Technological advancements have extracted a vast amount of useful knowledge and information for applications and services. These developments have evoked intelligent solutions that have been utilized in efforts to secure this data and avoid potential complex problems. Advances in Secure Computing, Internet Services, and Applications presents current research on the applications of computational intelligence in order to focus on the challenge humans face when securing knowledge and data. This book is a vital reference source for researchers, lecturers, professors, students, and developers, who have interest in secure computing and recent advanced in real life applications.**

RECENT TRENDS IN ARTIFICIAL NEURAL NETWORKS

FROM TRAINING TO PREDICTION

BoD – Books on Demand **Artificial intelligence (AI) is everywhere and it's here to stay. Most aspects of our lives are now touched by artificial intelligence in one way or another, from deciding what books or flights to buy online to whether our job applications are successful, whether we receive a bank loan, and even what treatment we receive for cancer. Artificial Neural Networks (ANNs) as a part of AI maintains the capacity to solve problems such as regression and classification with high levels of accuracy. This book aims to discuss the usage of ANNs for optimal solving of time series applications and clustering. Bounding of optimization methods particularly metaheuristics considered as global optimizers with ANNs make a strong and reliable prediction tool for handling real-life application. This book also demonstrates how different fields of studies utilize ANNs proving its wide reach and relevance.**

FROM STATISTICS TO NEURAL NETWORKS

THEORY AND PATTERN RECOGNITION APPLICATIONS

Springer Science & Business Media **The NATO Advanced Study Institute From Statistics to Neural Networks, Theory and Pattern Recognition Applications took place in Les Arcs, Bourg Saint Maurice, France, from June 21 through July 2, 1993. The meeting brought to gether over 100 participants (including 19 invited lecturers) from 20 countries. The invited lecturers whose contributions appear in this volume are: L. Almeida (INESC, Portugal), G. Carpenter (Boston, USA), V. Cherkassky (Minnesota, USA), F. Fogelman Soulie (LRI, France), W. Freeman (Berkeley, USA), J. Friedman (Stanford, USA), F. Girosi (MIT, USA and IRST, Italy), S. Grossberg (Boston, USA), T. Hastie (AT&T, USA), J. Kittler (Surrey, UK), R. Lippmann (MIT Lincoln Lab, USA), J. Moody (OGI, USA), G. Palm (U1m, Germany), B. Ripley (Oxford, UK), R. Tibshirani (Toronto, Canada), H. Wechsler (GMU, USA), C. Wellekens (Eurecom, France) and H. White (San Diego, USA). The ASI consisted of lectures overviewing major aspects of statistical and neural network learning, their links to biological learning and non-linear dynamics (chaos), and real-life examples of pattern recognition applications. As a result of lively interactions between the participants, the following topics emerged as major themes of the meeting: (1) Unified framework for the study of Predictive Learning in Statistics and Artificial Neural Networks (ANNs); (2) Differences and similarities between statistical and ANN methods for non parametric estimation from examples (learning); (3) Fundamental connections between artificial learning systems and biological learning systems.**

ORGANIZATIONAL LEARNING AND KNOWLEDGE TECHNOLOGIES IN A DYNAMIC ENVIRONMENT

Springer Science & Business Media **Richly illustrated, and covering every aspect of the field from anatomy to ancillary**

techniques such as facial fillers, this authoritative work examines new procedures in addition to variations on existing approaches and is an invaluable resource to surgeons.

INTELLIGENT DATA MINING IN LAW ENFORCEMENT ANALYTICS

NEW NEURAL NETWORKS APPLIED TO REAL PROBLEMS

Springer Science & Business Media **This book provides a thorough summary of the means currently available to the investigators of Artificial Intelligence for making criminal behavior (both individual and collective) foreseeable, and for assisting their investigative capacities. The volume provides chapters on the introduction of artificial intelligence and machine learning suitable for an upper level undergraduate with exposure to mathematics and some programming skill or a graduate course. It also brings the latest research in Artificial Intelligence to life with its chapters on fascinating applications in the area of law enforcement, though much is also being accomplished in the fields of medicine and bioengineering. Individuals with a background in Artificial Intelligence will find the opening chapters to be an excellent refresher but the greatest excitement will likely be the law enforcement examples, for little has been done in that area. The editors have chosen to shine a bright light on law enforcement analytics utilizing artificial neural network technology to encourage other researchers to become involved in this very important and timely field of study.**

APPLICATIONS OF NEURAL NETWORKS IN ENVIRONMENT, ENERGY AND HEALTH

World Scientific **This book contains the proceedings of the Workshop on Environmental and Energy Applications of Neural Networks. The purpose of this workshop was to provide a forum for discussing environmental, energy, and biomedical applications of neural networks. The applications covered in these proceedings include modeling and predicting soil, air and water pollution; waste reduction; environmental sensing; spectroscopy; hazardous waste handling and cleanup; environmental monitoring of power plants; process monitoring and optimization of power systems; modeling and control of power plants; power load forecasting; fault location and diagnosis of power systems; medical image and signal analysis; medical diagnosis; analysis of environmental health effects; health insurance, and modeling biological systems. Contents:Neural Network Models: Insights and Prescriptions from Practical ApplicationsPrediction Horizon Effects on Stochastic Modeling Hints for Neural NetworksNeural Network Analysis for Hazardous Waste CharacterizationNeural Networks for Nuclear SpectroscopyNeural Network Utility in Nondestructive Transuranic Waste Assay, Initial InvestigationsApplication of Neural Networks to Determine Moisture Content on Humidity–Attenuated Near Infrared SpectraFluorescent Diagnostics of Organic Pollution in Natural Walters: A Neural Network Approach; Reliability and Risk Analysis Using Artificial Neural NetworksElectronic Noses and Their Applications in Environmental MonitoringApplication of Computational Neural Networks in Predicting Atmospheric Pollutant Concentrations Due to Fossil–Fired Electric Power Generationand other papers. Readership: Researchers in neural networks. keywords:**

CRITICAL DEVELOPMENTS AND APPLICATIONS OF SWARM INTELLIGENCE

IGI Global **Artificial intelligence is a constantly advancing field that requires models in order to accurately create functional systems. The use of natural acumen to create artificial intelligence creates a field of research in which the natural and the artificial meet in a new and innovative way. Critical Developments and Applications of Swarm Intelligence is a critical academic publication that examines developing research, technologies, and function regarding natural and artificial acumen specifically, in regards to self-organized systems. Featuring coverage on a broad range of topics such as evolutionary algorithms, optimization techniques, and computational comparison, this book is geared toward academicians, students, researchers, and engineers seeking relevant and current research on the progressive research based on the implementation of swarm intelligence in self-organized systems.**

INTELLIGENT DATA ANALYSIS FOR REAL-LIFE APPLICATIONS: THEORY AND PRACTICE

THEORY AND PRACTICE

IGI Global **With the recent and enormous increase in the amount of available data sets of all kinds, applying effective and efficient techniques for analyzing and extracting information from that data has become a crucial task. Intelligent Data Analysis for Real-Life Applications: Theory and Practice investigates the application of Intelligent Data Analysis (IDA) to these data sets through the design and development of algorithms and techniques to extract knowledge from databases. This pivotal reference explores practical applications of IDA, and it is essential for academic and research libraries as well as students, researchers, and educators in data analysis, application development, and database management.**

RECENT ADVANCES IN FACE RECOGNITION

BoD – Books on Demand **The main idea and the driver of further research in the area of face recognition are security applications and human-computer interaction. Face recognition represents an intuitive and non-intrusive method of recognizing people and this is why it became one of three identification methods used in e-passports and a biometric of choice for many other security applications. This goal of this book is to provide the reader with the most up to date research performed in automatic face recognition. The chapters presented use innovative approaches to deal with a wide variety of unsolved issues.**

AN EXPLORATION AND DEVELOPMENT OF CURRENT ARTIFICIAL NEURAL NETWORK THEORY AND APPLICATIONS WITH EMPHASIS ON ARTIFICIAL LIFE

THE PAP SMEAR

CRC Press **This book covers established light microscopy for screening smears and also new techniques for establishing cell proliferation in smears, confocal microscopy and the applications of neural networks in the screening process. Also addressed are the inherent limitations of conventional screening procedures.**

INTELLIGENT COMPUTING THEORIES AND APPLICATION

15TH INTERNATIONAL CONFERENCE, ICIC 2019, NANCHANG, CHINA, AUGUST 3–6, 2019, PROCEEDINGS, PART I

Springer **This two-volume set of LNCS 11643 and LNCS 11644 constitutes - in conjunction with the volume LNAI 11645 - the refereed proceedings of the 15th International Conference on Intelligent Computing, ICIC 2019, held in Nanchang, China, in August 2019. The 217 full papers of the three proceedings volumes were carefully reviewed and selected from 609 submissions. The ICIC theme unifies the picture of contemporary intelligent computing techniques as an integral concept that highlights the trends in advanced computational intelligence and bridges theoretical research with applications. The theme for this conference is "Advanced Intelligent Computing Methodologies and Applications." Papers related to this theme are especially solicited, including theories, methodologies, and applications in science and technology.**

INTELLIGENT TECHNOLOGIES

THEORY AND APPLICATIONS : NEW TRENDS IN INTELLIGENT TECHNOLOGIES

IOS Press **This volume includes theoretical, as well as applicational, papers in the field of neural networks, fuzzy systems and mainly evolutionary computations in which application potential was increased by enormous progress in computer power. The book presents papers from Japan, USA, Hungary, Poland, Germany, Finland, France, Slovakia, UK, Czech Republic and some other countries. It describes the state of the art in the field and contributes to theory and applications in the field of machine intelligence tools and their wide application potential in current and future technologies within the information society.**

PYTORCH BOOTCAMP FOR ARTIFICIAL NEURAL NETWORKS AND DEEP LEARNING APPLICATIONS

Hands-on PyTorch boot camp for Artificial Intelligence applications with artificial neural networks and deep learning About This Video A full introduction to Python Data Science and Anaconda, a powerful Python-driven data science framework Thorough grounding in how to use PyTorch to implement common deep learning algorithms such as Convolutional Neural Networks (CNNs) on real-life data Limited mathematical jargon. The course focuses on teaching people basic Python data science concepts and builds up to using PyTorch In Detail Master the latest and hottest deep learning frameworks (PyTorch) for Python data science This course is your complete guide to practical machine learning and deep learning using the PyTorch framework in Python and covers the important aspects of PyTorch. If you take this course, you'll have no need to take other courses or buy books on PyTorch. In this age of big data, companies across the Globe use Python to sift through the avalanche of information at their disposal; the advent of frameworks such as PyTorch is revolutionizing deep learning. By gaining proficiency in PyTorch, you can give your company a competitive edge and take your career to the next level. After taking this course, you'll be able to use packages such as Numpy, Pandas, and PIL to work with real data in Python and you'll be fluent in PyTorch. We even introduce you to deep learning models such as Convolution Neural Networks (CNNs)! The underlying motivation for the course is to ensure you can apply Python-based data science on real data today, start analyzing data for your own projects whatever your skill level, and impress potential employers with actual examples of your data science abilities.

COMPUTATIONAL INTELLIGENCE PARADIGMS

THEORY & APPLICATIONS USING MATLAB

CRC Press **Offering a wide range of programming examples implemented in MATLAB®, Computational Intelligence Paradigms: Theory and Applications Using MATLAB® presents theoretical concepts and a general framework for computational intelligence (CI) approaches, including artificial neural networks, fuzzy systems, evolutionary computation, genetic algorithms and programming, and swarm intelligence. It covers numerous intelligent computing methodologies and algorithms used in CI research. The book first focuses on neural networks, including common artificial neural networks; neural networks based on data classification, data association, and data conceptualization; and real-world applications of neural networks. It then discusses fuzzy sets, fuzzy rules, applications of fuzzy systems, and different types of fused neuro-fuzzy systems, before providing MATLAB illustrations of ANFIS, classification and regression trees, fuzzy c-means clustering algorithms, fuzzy ART map, and Takagi–Sugeno inference systems. The authors also describe the history, advantages, and disadvantages of evolutionary computation and include solved MATLAB programs to illustrate the implementation of evolutionary computation in various problems. After exploring the operators and parameters of genetic algorithms, they cover the steps and MATLAB routines of genetic programming. The final chapter introduces swarm intelligence and its applications, particle swarm optimization, and ant colony optimization. Full of worked examples and end-of-chapter questions, this comprehensive book explains how**

to use MATLAB to implement CI techniques for the solution of biological problems. It will help readers with their work on evolution dynamics, self-organization, natural and artificial morphogenesis, emergent collective behaviors, swarm intelligence, evolutionary strategies, genetic programming, and the evolution of social behaviors.

EMERGING ARTIFICIAL INTELLIGENCE APPLICATIONS IN COMPUTER ENGINEERING

REAL WORD AI SYSTEMS WITH APPLICATIONS IN EHEALTH, HCI, INFORMATION RETRIEVAL AND PERVASIVE TECHNOLOGIES

IOS Press "The ever expanding abundance of information and computing power enables researchers and users to tackle highly interesting issues for the first time, such as applications providing personalized access and interactivity to multimodal information based on user preferences and semantic concepts or human-machine interface systems utilizing information on the affective state of the user. The purpose of this book is to provide insights on how todays computer engineers can implement AI in real world applications. Overall, the field of artificial intelligence is extremely broad. In essence, AI has found applications, in one way or another, in every aspect of computing and in most aspects of modern life. Consequently, it is not possible to provide a complete review of the field in the framework of a single book, unless if the review is broad rather than deep. In this book we have chosen to present selected current and emerging practical applications of AI, thus allowing for a more detailed presentation of topics. The book is organized in four parts; General Purpose Applications of AI; Intelligent Human-Computer Interaction; Intelligent Applications in Signal Processing and eHealth; and Real world AI applications in Computer Engineering."

COMPOSITE MATERIALS TECHNOLOGY

NEURAL NETWORK APPLICATIONS

CRC Press Artificial neural networks (ANN) can provide new insight into the study of composite materials and can normally be combined with other artificial intelligence tools such as expert system, genetic algorithm, and fuzzy logic. Because research on this field is very new, there is only a limited amount of published literature on the subject. Compiling information from diverse sources, Composite Materials Technology: Neural Network Applications fills the void in knowledge of these important networks, covering composite mechanics, materials characterization, product design, and other important aspects of polymer matrix composites. Light weight, corrosion resistance, good stiffness and strength properties, and part consolidation are just some of the reasons that composites are useful in areas including civil engineering and structure, chemical processing, management, agriculture, space study, and manufacturing. ANN has already been used to carry out design prediction, mechanical property prediction, and selection processes in the evolution of composites, but although it has already been used with great success in various branches of scientific and technological research, it is still in the nascent stage of its development. Featuring contributions from leading researchers throughout the world, this book is divided into four parts, starting with an introduction to neural networks and a review of existing literature on the subject. The text then covers structural health monitoring and damage detection in composites, addresses mechanical properties, and discusses design, analysis, and materials selection. Training, testing, and validation of experimental data were carried out to optimize the results presented in the book. This book will be an important aid to researchers as they work on the future implementation of ANN in industries such as aerospace, automotive, marine, sporting goods, furniture, and electronics and communication.

INFORMATICS IN CONTROL, AUTOMATION AND ROBOTICS I

Springer Science & Business Media This is a collection of papers presented at the 1st International Conference on Informatics in Control, Automation and Robotics (ICINCO). The papers focus on real world applications, covering three main themes: Intelligent Control Systems, Optimization, Robotics and Automation, Signal Processing, Systems Modeling and Control. The book will interest professionals in the areas of control and robotics.

MATERIALS DESIGN AND APPLICATIONS II

Springer This book highlights fundamental research on the design and application of engineering materials, and predominantly mechanical engineering applications. This area includes a wide range of technologies and materials, including metals, polymers, composites, and ceramics. Advanced applications include manufacturing cutting-edge materials, testing methods, and multi-scale experimental and computational aspects. The book introduces readers to a wealth of engineering applications in transport, civil, packaging and power generation.

APPLICATION OF ARTIFICIAL NEURAL NETWORKS TO THE DESIGN OPTIMIZATION OF AEROSPACE STRUCTURAL COMPONENTS

FUZZY LOGIC AND EXPERT SYSTEMS APPLICATIONS

Elsevier This volume covers the integration of fuzzy logic and expert systems. A vital resource in the field, it includes techniques for applying fuzzy systems to neural networks for modeling and control, systematic design procedures for realizing fuzzy neural systems, techniques for the design of rule-based expert systems using the massively parallel processing capabilities of neural networks, the transformation of neural systems into rule-based expert systems, the characteristics and relative merits of integrating fuzzy sets, neural networks, genetic algorithms, and rough sets, and

applications to system identification and control as well as nonparametric, nonlinear estimation. Practitioners, researchers, and students in industrial, manufacturing, electrical, and mechanical engineering, as well as computer scientists and engineers will appreciate this reference source to diverse application methodologies. Fuzzy system techniques applied to neural networks for modeling and control Systematic design procedures for realizing fuzzy neural systems Techniques for the design of rule-based expert systems Characteristics and relative merits of integrating fuzzy sets, neural networks, genetic algorithms, and rough sets System identification and control Nonparametric, nonlinear estimation Practitioners, researchers, and students in industrial, manufacturing, electrical, and mechanical engineering, as well as computer scientists and engineers will find this volume a unique and comprehensive reference to these diverse application methodologies

COMPUTER AIDED AND INTEGRATED MANUFACTURING SYSTEMS

VOLUME 1: COMPUTER TECHNIQUES

World Scientific **This is an invaluable five-volume reference on the very broad and highly significant subject of computer aided and integrated manufacturing systems. It is a set of distinctly titled and well-harmonized volumes by leading experts on the international scene. The techniques and technologies used in computer aided and integrated manufacturing systems have produced, and will no doubt continue to produce, major annual improvements in productivity, which is defined as the goods and services produced from each hour of work. This publication deals particularly with more effective utilization of labor and capital, especially information technology systems. Together the five volumes treat comprehensively the major techniques and technologies that are involved.**

APPLICATIONS OF MATHEMATICS IN MODELS, ARTIFICIAL NEURAL NETWORKS AND ARTS

MATHEMATICS AND SOCIETY

Springer Science & Business Media **The book shows a very original organization addressing in a non traditional way, but with a systematic approach, to who has an interest in using mathematics in the social sciences. The book is divided in four parts: (a) a historical part, written by Vittorio Capecchi which helps us understand the changes in the relationship between mathematics and sociology by analyzing the mathematical models of Paul F. Lazarsfeld, the model of simulation and artificial societies, models of artificial neural network and considering all the changes in scientific paradigms considered; (b) a part coordinated by Pier Luigi Contucci on mathematical models that consider the relationship between the mathematical models that come from physics and linguistics to arrive at the study of society and those which are born within sociology and economics; (c) a part coordinated by Massimo Buscema analyzing models of artificial neural networks; (d) a part coordinated by Bruno D'Amore which considers the relationship between mathematics and art. The title of the book "Mathematics and Society" was chosen because the mathematical applications exposed in the book allow you to address two major issues: (a) the general theme of technological innovation and quality of life (among the essays are on display mathematical applications to the problems of combating pollution and crime, applications to mathematical problems of immigration, mathematical applications to the problems of medical diagnosis, etc.) (b) the general theme of technical innovation and creativity, for example the art and mathematics section which connects to the theme of creative cities. The book is very original because it is not addressed only to those who are passionate about mathematical applications in social science but also to those who, in different societies, are: (a) involved in technological innovation to improve the quality of life; (b) involved in the wider distribution of technological innovation in different areas of creativity (as in the project "Creative Cities Network" of UNESCO).**

THE THE DEEP LEARNING WITH PYTORCH WORKSHOP

BUILD DEEP NEURAL NETWORKS AND ARTIFICIAL INTELLIGENCE APPLICATIONS WITH PYTORCH

Packt Publishing Ltd **Get a head start in the world of AI and deep learning by developing your skills with PyTorch Key FeaturesLearn how to define your own network architecture in deep learningImplement helpful methods to create and train a model using PyTorch syntaxDiscover how intelligent applications using features like image recognition and speech recognition really process your dataBook Description Want to get to grips with one of the most popular machine learning libraries for deep learning? The Deep Learning with PyTorch Workshop will help you do just that, jumpstarting your knowledge of using PyTorch for deep learning even if you're starting from scratch. It's no surprise that deep learning's popularity has risen steeply in the past few years, thanks to intelligent applications such as self-driving vehicles, chatbots, and voice-activated assistants that are making our lives easier. This book will take you inside the world of deep learning, where you'll use PyTorch to understand the complexity of neural network architectures. The Deep Learning with PyTorch Workshop starts with an introduction to deep learning and its applications. You'll explore the syntax of PyTorch and learn how to define a network architecture and train a model. Next, you'll learn about three main neural network architectures - convolutional, artificial, and recurrent - and even solve real-world data problems using these networks. Later chapters will show you how to create a style transfer model to develop a new image from two images, before finally taking you through how RNNs store memory to solve key data issues. By the end of this book, you'll have mastered the essential concepts, tools, and libraries of PyTorch to develop your own deep neural networks and intelligent apps. What you will learnExplore the different applications of deep learningUnderstand the PyTorch approach to building neural networksCreate and train your very own perceptron using PyTorchSolve regression problems using artificial neural networks (ANNs)Handle computer vision problems with**

convolutional neural networks (CNNs)Perform language translation tasks using recurrent neural networks (RNNs)Who this book is for This deep learning book is ideal for anyone who wants to create and train deep learning models using PyTorch. A solid understanding of the Python programming language and its packages will help you grasp the topics covered in the book more quickly.

ARTIFICIAL NEURAL NETWORKS IN MEDICINE AND BIOLOGY

PROCEEDINGS OF THE ANNIMAB-1 CONFERENCE, GÖTEBORG, SWEDEN, 13-16 MAY 2000

Springer Science & Business Media **This volume comprises a selection of papers presented at ANNIMAB-1, the first conference to focus specifically on the topics of ANNs in medicine and biology. It covers three main areas: The medical applications of ANNs, such as in diagnosis and outcome prediction, medical image analysis, and medical signal processing; The uses of ANNs in biology outside clinical medicine, such as in data analysis, in molecular biology, and in simulations of biological systems; The theoretical aspects of ANNs, examining recent developments in learning algorithms and the possible role of ANNs in the medical decision process. Summarising the state-of-the-art and analysing the relationship between ANN techniques and other available methods, it also points to possible future biological and medical uses of ANNs. Essential reading for all neural network theorists, it will also be of interest to biologists and physicians with an interest in modelling and advanced statistical techniques.**

BAYESIAN NETWORKS

A PRACTICAL GUIDE TO APPLICATIONS

John Wiley & Sons **Bayesian Networks, the result of the convergence of artificial intelligence with statistics, are growing in popularity. Their versatility and modelling power is now employed across a variety of fields for the purposes of analysis, simulation, prediction and diagnosis. This book provides a general introduction to Bayesian networks, defining and illustrating the basic concepts with pedagogical examples and twenty real-life case studies drawn from a range of fields including medicine, computing, natural sciences and engineering. Designed to help analysts, engineers, scientists and professionals taking part in complex decision processes to successfully implement Bayesian networks, this book equips readers with proven methods to generate, calibrate, evaluate and validate Bayesian networks. The book: Provides the tools to overcome common practical challenges such as the treatment of missing input data, interaction with experts and decision makers, determination of the optimal granularity and size of the model. Highlights the strengths of Bayesian networks whilst also presenting a discussion of their limitations. Compares Bayesian networks with other modelling techniques such as neural networks, fuzzy logic and fault trees. Describes, for ease of comparison, the main features of the major Bayesian network software packages: Netica, Hugin, Elvira and Discoverer, from the point of view of the user. Offers a historical perspective on the subject and analyses future directions for research. Written by leading experts with practical experience of applying Bayesian networks in finance, banking, medicine, robotics, civil engineering, geology, geography, genetics, forensic science, ecology, and industry, the book has much to offer both practitioners and researchers involved in statistical analysis or modelling in any of these fields.**

FATIGUE IN COMPOSITES

SCIENCE AND TECHNOLOGY OF THE FATIGUE RESPONSE OF FIBRE-REINFORCED PLASTICS

Elsevier **This major handbook is the first authoritative survey of current knowledge of fatigue behaviour of composites. It deals in detail with a wide range of problems met by designers in the automotive, marine and structural engineering industries. Compiled from the contributions of some of the best-known researchers in the field, it provides an invaluable, practical and encyclopaedic handbook covering recent developments. Comprehensively discusses the problems of fatigue in composites met by designers in the aerospace, marine and structural engineering industries Provides a general introduction on fatigue in composites before reviewing current research on micromechanical aspects Analyses various types of composites with respect to fatigue behaviour and testing and provides in-depth coverage of life-prediction models for constant variable stresses**

AN INTRODUCTION TO NEURAL NETWORKS

CRC Press **Though mathematical ideas underpin the study of neural networks, the author presents the fundamentals without the full mathematical apparatus. All aspects of the field are tackled, including artificial neurons as models of their real counterparts; the geometry of network action in pattern space; gradient descent methods, including back-propagation; associative memory and Hopfield nets; and self-organization and feature maps. The traditionally difficult topic of adaptive resonance theory is clarified within a hierarchical description of its operation. The book also includes several real-world examples to provide a concrete focus. This should enhance its appeal to those involved in the design, construction and management of networks in commercial environments and who wish to improve their understanding of network simulator packages. As a comprehensive and highly accessible introduction to one of the most important topics in cognitive and computer science, this volume should interest a wide range of readers, both students and professionals, in cognitive science, psychology, computer science and electrical engineering.**