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NEURAL NETWORKS, FUZZY LOGIC AND GENETIC ALGORITHM Introduction to Neuro-Fuzzy Systems Explainable Neural Networks Based on Fuzzy Logic and Multi-criteria Decision Tools Fuzzy Logic and Neural Network Handbook Understanding Neural Networks and Fuzzy Logic Computational Intelligence Neural Networks & Fuzzy Logic Knowledge-Based Neurocomputing: A Fuzzy Logic Approach Intelligent Hybrid Systems Intuitionistic and Type-2 Fuzzy Logic Enhancements in Neural and Optimization Algorithms: Theory and Applications Fuzzy Logic and Neural Networks Foundations of Neural Networks, Fuzzy Systems, and Knowledge Engineering Computational Intelligence and Its Applications Deep Neuro-Fuzzy Systems with Python Fuzzy Logic and Neural Networks for Hybrid Intelligent System Design Fuzzy Logic Hybrid Extensions of Neural and Optimization Algorithms: Theory and Applications Design of Intelligent Systems Based on Fuzzy Logic, Neural Networks and Nature-Inspired Optimization Neural and Fuzzy Logic Control of Drives and Power Systems Neural Network and Fuzzy Logic Applications in C/C+ Soft Computing Neuro-Fuzzy Pattern Recognition C++ Neural Networks and Fuzzy Logic Intelligent Control Fuzzy-neural Control Neural Fuzzy Control Systems with Structure and Parameter Learning Fuzzy Logic Augmentation of Neural and Optimization Algorithms: Theoretical Aspects and Real Applications Fuzzy and Neuro-Fuzzy Systems in Medicine Advances in Fuzzy Logic, Neural Networks and Genetic Algorithms Intelligent Control Fuzzy Logic, Neural Networks, and Evolutionary Computation Fuzzy logic and neural networks [electronic resource] Hybrid Intelligent Systems Based on Extensions of Fuzzy Logic, Neural Networks and Metaheuristics Intelligent Hybrid Systems Fuzzy and Neuro-Fuzzy Intelligent Systems Modular Neural Networks and Type-2 Fuzzy Systems for Pattern Recognition New Perspectives on Hybrid Intelligent System Design based on Fuzzy Logic, Neural Networks and Metaheuristics Fuzzy Logic and Expert Systems Applications Methodologies Of Using Neural Network And Fuzzy Logic Technologies For Motor Incipient Fault Detection Soft Computing Advances in Fuzzy Logic, Neural Networks and Genetic Algorithms

NEURAL NETWORKS, FUZZY LOGIC AND GENETIC ALGORITHM 2003-01-01

this book provides comprehensive introduction to a consortium of technologies underlying soft computing an evolving branch of computational intelligence the constituent technologies discussed comprise neural networks fuzzy logic genetic algorithms and a number of hybrid systems which include classes such as neuro fuzzy fuzzy genetic and neuro genetic systems the hybridization of the technologies is demonstrated on architectures such as fuzzy back propagation networks nn fl simplified fuzzy artmap nn fl and fuzzy associative memories the book also gives an exhaustive discussion of fl ga hybridization every architecture has been discussed in detail through illustrative examples and applications the algorithms have been presented in pseudo code with a step by step illustration of the same in problems the applications demonstrative of the potential of the architectures have been chosen from diverse disciplines of science and engineering this book with a wealth of information that is clearly presented and illustrated by many examples and applications is designed for use as a text for courses in soft computing at both the senior undergraduate and first year post graduate engineering levels it should also be of interest to researchers and technologists desirous of applying soft computing technologies to their respective fields of work

Introduction to Neuro-Fuzzy Systems *2000*

this book contains introductory material to neuro fuzzy systems its main purpose is to explain the information processing in mostly used fuzzy inference systems neural networks and neuro fuzzy systems more than 180 figures and a large number of numerical exercises with solutions have been inserted to explain the principles of fuzzy neural and neuro fuzzy systems also the mathematics applied in the models is carefully explained and in many cases exact computational formulas have been derived for the rules in error correction learning procedures numerous models treated in the book will help the reader to design his own neuro fuzzy system for his specific managerial industrial financial problem the book can serve as a textbook for students in computer and management sciences who are interested in adaptive technologies

Explainable Neural Networks Based on Fuzzy Logic and Multi-criteria Decision Tools *2021-04-28*

the research presented in this book shows how combining deep neural networks with a special class of fuzzy logical rules and multi criteria decision tools can make deep neural networks more interpretable and even in many cases more efficient fuzzy logic together with multi criteria decision making tools provides very powerful tools for modeling human thinking based on their common theoretical basis we propose a consistent framework for modeling human thinking by using the tools of all three fields fuzzy logic multi criteria decision making and deep learning to help reduce the black box nature of neural models a challenge that is of vital importance to the whole research community

Fuzzy Logic and Neural Network Handbook *1996*

a practical reference that presents concise and comprehensive reports on the major activities in fuzzy logic and neural networks with emphasis on the applications and systems of interest to computer engineers each of the 31 chapters focuses on the most important activity of a specific topic and the chapters are organized into three parts principles and algorithms applications and architectures and systems the applications for fuzzy logic include home appliance design and manufacturing process those for neural networks include radar sonar and speech signal processing remote sensing and electrical power systems annotation copyright by book news inc portland or

Understanding Neural Networks and Fuzzy Logic *1996*

understand the fundamentals of the emerging field of fuzzy neural networks their applications and the most used paradigms with this carefully organized state of the art textbook previously tested at a number of noteworthy conference tutorials the simple numerical examples presented in this book provide excellent tools for progressive learning understanding neural networks and fuzzy logic offers a simple presentation and bottom up approach that is ideal for working professional engineers undergraduates medical biology majors and anyone with a nonspecialist background sponsored by ieee neural networks council

Computational Intelligence *2013-05-06*

computational intelligence synergies of fuzzy logic neuralnetworks and evolutionary computing presents an introduction tosome of the cutting edge technological paradigms under the umbrellaof computational intelligence computational intelligence schemesare investigated with the development of a suitable

framework forfuzzy logic neural networks and evolutionary computing neuro fuzzy systems evolutionary fuzzy systems and evolutionaryneural systems applications to linear and non linear systems arediscussed with examples key features covers all the aspects of fuzzy neural and evolutionaryapproaches with worked out examples matlab exercises andapplications in each chapter presents the synergies of technologies of computationalintelligence such as evolutionary fuzzy neural fuzzy andevolutionary neural systems considers real world problems in the domain of systemsmodelling control and optimization contains a foreword written by lotfi zadeh computational intelligence synergies of fuzzy logic neuralnetworks and evolutionary computing is an ideal text for finalyear undergraduate postgraduate and research students inelectrical control computer industrial and manufacturingengineering

Neural Networks & Fuzzy Logic *2009*

this book details the state of the art in knowledge based neurocomputing it introduces a novel fuzzy rule base known as fuzzy all permutations rule base farb and presents new connections between artificial neural networks and farb

Knowledge-Based Neurocomputing: A Fuzzy Logic Approach *2009-01-17*

intelligent hybrid systems fuzzy logic neural networks and genetic algorithms is an organized edited collection of contributed chapters covering basic principles methodologies and applications of fuzzy systems neural networks and genetic algorithms all chapters are original contributions by leading researchers written exclusively for this volume this book reviews important concepts and models and focuses on specific methodologies common to fuzzy systems neural networks and evolutionary computation the emphasis is on development of cooperative models of hybrid systems included are applications related to intelligent data analysis process analysis intelligent adaptive information systems systems identification nonlinear systems power and water system design and many others intelligent hybrid systems fuzzy logic neural networks and genetic algorithms provides researchers and engineers with up to date coverage of new results methodologies and applications for building intelligent systems capable of solving large scale problems

Intelligent Hybrid Systems *1997-09-30*

this book describes the latest advances in fuzzy logic neural networks and optimization algorithms as well as their hybrid intelligent combinations and their applications in the areas such as intelligent control robotics pattern recognition medical diagnosis time series prediction and optimization the topic is highly relevant as most current intelligent systems and devices use some form of intelligent feature to enhance their performance the book also presents new and advanced models and algorithms of type 2 fuzzy logic and intuitionistic fuzzy systems which are of great interest to researchers in these areas further it proposes novel nature inspired optimization algorithms and innovative neural models featuring contributions on theoretical aspects as well as applications the book appeals to a wide audience

Intuitionistic and Type-2 Fuzzy Logic Enhancements in Neural and Optimization Algorithms: Theory and Applications 2020-02-27

combines the study of neural networks and fuzzy systems with symbolic artificial intelligence ai methods to build comprehensive ai systems describes major ai problems pattern recognition speech recognition prediction decision making game playing and provides illustrative examples includes applications in engineering business and finance

Fuzzy Logic and Neural Networks *1996*

this book focuses on computational intelligence techniques and their applications fast growing and promising research topics that have drawn a great deal of attention from researchers over the years it brings together many different aspects of the current research on intelligence technologies such as neural networks support vector machines fuzzy logic and evolutionary computation and covers a wide range of applications from pattern recognition and system modeling to intelligent control problems and biomedical applications fundamental concepts and essential analysis of various computational techniques are presented to offer a systematic and effective tool for better treatment of different applications and simulation and experimental results are included to illustrate the design procedure and the effectiveness of the approaches sample chapter s chapter 1 maximal margin algorithms for pose estimation 658 kb contents evolutionary computation and its applications maximal margin algorithms for pose estimation ying guo and jiaming li polynomial modeling in a dynamic environment based on a particle swarm optimization kit yan chan and tharam s dillon restoration of half toned color quantized

images using particle swarm optimization with multi wavelet mutation frank h f leung benny c w yeung and y h chan fuzzy logics and their applications hypoglycemia detection for insulin dependent diabetes mellitus evolved fuzzy inference system approach s h ling p p san and h t nguyen neural networks and their applications study of limit cycle behavior of weights of perceptron c y f ho and b w k ling artificial neural network modeling with application to nonlinear dynamics yi zhao solving eigen problems of matrices by neural networks yiguang liu zhisheng you bingbing liu and jiliu zhou automated screw insertion monitoring using neural networks a computational intelligence approach to assembly in manufacturing bruno lara lakmal d seneviratne and kaspar althoefer support vector machines and their applications on the applications of heart disease risk classification and hand written character recognition using support vector machines s r alty h k lam and j prada nonlinear modeling using support vector machine for heart rate response to exercise weidong chen steven w su yi zhang ying guo nghir nguyen branko g celler and hung t nguyen machine learning based nonlinear model predictive control for heart rate response to exercise yi zhang steven w su branko g celler and hung t nguyen intelligent fault detection and isolation of hvac system based on online support vector machine davood dehestani ying guo sai ho ling steven w su and hung t nguyen readership graduates and researchers in computer science especially those specialising in artificial intelligence neural networks fuzzy logic and pattern recognition keywords evolutionary computation fuzzy logic neural networks support vector machinekey features covers wide ranging applications from pattern recognition control systems to biomedical applications various computational techniques are proposed and presented in detail for the treatment of various problemsmost of the applications in this book are real and high impact such as hypoglycaemia detection for diabetes patients cardio respiratory response estimation pattern recognition and pose estimationaddresses important related problems and difficulties using the collective experiences and knowledge from the contributors who are each prominent in their own area of research

Foundations of Neural Networks, Fuzzy Systems, and Knowledge Engineering *2012-07-17*

gain insight into fuzzy logic and neural networks and how the integration between the two models makes intelligent systems in the current world this book simplifies the implementation of fuzzy logic and neural network concepts using python you ll start by walking through the basics of fuzzy sets and relations and how each member of the set has its own membership function values you ll also look at different architectures and models that have been developed and how rules and reasoning have been defined to make the architectures possible the book then provides a closer look at neural networks and related architectures focusing on the various issues neural networks may encounter during training and how different optimization methods can help you resolve them in the last section of the book you ll examine the integrations of fuzzy logics and neural networks the adaptive neuro fuzzy inference systems and various approximations related to the same you ll review different types of deep neuro fuzzy classifiers fuzzy neurons and the adaptive learning capability of the neural networks the book concludes by reviewing advanced neuro fuzzy models and applications what you ll learn understand fuzzy logic membership functions fuzzy relations and fuzzy inferencereview neural networks back propagation and optimizationwork with different architectures such as takagi sugeno model hybrid model genetic algorithms and approximations apply python implementations of deep neuro fuzzy system who this book is for data scientists and software engineers with a basic understanding of machine learning who want to expand into the hybrid applications of deep learning and fuzzy logic

Computational Intelligence and Its Applications *2019-11-30*

this book covers recent developments on fuzzy logic neural networks and optimization algorithms as well as their hybrid combinations in addition the above mentioned methods are applied to areas such as intelligent control and robotics pattern recognition medical diagnosis time series prediction and optimization of complex problems nowadays the main topic of the book is highly relevant as most current intelligent systems and devices in use utilize some form of intelligent feature to enhance their performance in addition on the theoretical side new and advanced models and algorithms of type 2 and type 3 fuzzy logic are presented which are of great interest to researchers working on these areas also new nature inspired optimization algorithms and innovative neural models are put forward in the manuscript which are very popular subjects at this moment there are contributions on theoretical aspects as well as applications which make the book very appealing to a wide audience ranging from researchers to professors and graduate students

Deep Neuro-Fuzzy Systems with Python 2023-01-27

we describe in this book recent developments on fuzzy logic neural networks and optimization algorithms as well as their hybrid combinations and their application in areas such as intelligent control and robotics pattern recognition medical diagnosis time series prediction and optimization of complex problems the book contains a collection of papers focused on hybrid intelligent systems based on soft computing there are some papers with the main theme of type 1 and type 2 fuzzy logic which basically consists of papers that propose new concepts and algorithms based on type 1 and type 2 fuzzy logic and their applications there also some papers that presents theory and practice of meta heuristics in

different areas of application another group of papers describe diverse applications of fuzzy logic neural networks and hybrid intelligent systems in medical applications there are also some papers that present theory and practice of neural networks in different areas of application in addition there are papers that present theory and practice of optimization and evolutionary algorithms in different areas of application finally there are some papers describing applications of fuzzy logic neural networks and meta heuristics in pattern recognition problems

Fuzzy Logic and Neural Networks for Hybrid Intelligent System Design *2021-03-24*

this book presents recent advances on the design of intelligent systems based on fuzzy logic neural networks and nature inspired optimization and their application in areas such as intelligent control and robotics pattern recognition time series prediction and optimization of complex problems the book is organized in eight main parts which contain a group of papers around a similar subject the first part consists of papers with the main theme of theoretical aspects of fuzzy logic which basically consists of papers that propose new concepts and algorithms based on fuzzy systems the second part contains papers with the main theme of neural networks theory which are basically papers dealing with new concepts and algorithms in neural networks the third part contains papers describing applications of neural networks in diverse areas such as time series prediction and pattern recognition the fourth part contains papers describing new nature inspired optimization algorithms the fifth part presents diverse applications of nature inspired optimization algorithms the sixth part contains papers describing new optimization algorithms the seventh part contains papers describing applications of fuzzy logic in diverse areas such as time series prediction and pattern recognition finally the eighth part contains papers that present enhancements to meta heuristics based on fuzzy logic techniques

Fuzzy Logic Hybrid Extensions of Neural and Optimization Algorithms: Theory and Applications 2015-06-12

introduces cutting edge control systems to a wide readership of engineers and students the first book on neuro fuzzy control systems to take a practical applications based approach backed up with worked examples and case studies learn to use vhdl in real world applications introducing cutting edge control systems through real world applications neural networks and fuzzy logic based systems offer a modern control solution to ac machines used in variable speed drives enabling industry to save costs and increase efficiency by replacing expensive and high maintenance dc motor systems the use of fast micros has revolutionised the field with sensorless vector control and direct torque control this book reflects recent research findings and acts as a useful guide to the new generation of control systems for a wide readership of advanced undergraduate and graduate students as well as practising engineers the authors guide readers quickly and concisely through the complex topics of neural networks fuzzy logic mathematical modelling of electrical machines power systems control and vhdl design unlike the academic monographs that have previously been published on each of these subjects this book combines them and is based round case studies of systems analysis control strategies design simulation and implementation the result is a guide to applied control systems design that will appeal equally to students and professional design engineers the book can also be used as a unique vhdl design aid based on real world power engineering applications

Design of Intelligent Systems Based on Fuzzy Logic, Neural Networks and Nature-Inspired Optimization *2002-10-08*

this volume presents a collection of articles on state of the art soft computing and ai applications that cover broad domains and many disciplines the authors explain the evolution of the mathematics behind the intelligent systems consider fuzzy logic and neural network applications and explore several ai applications

Neural and Fuzzy Logic Control of Drives and Power Systems *2005*

the neuro fuzzy approach to pattern recognition a unique overview recent years have seen a surge of interest in neuro fuzzy computing which combines fuzzy logic neural networks and soft computing techniques this book focuses on the application of this new tool to the rapidly evolving area of pattern recognition written by two leaders in neural networks and soft computing research this landmark work presents a unified comprehensive treatment of the state of the art in the field the authors consolidate a wealth of information previously cattered in disparate articles journals and edited volumes explaining both the theory of neuro fuzzy computing and the latest methodologies for performing different pattern recognition tasks in the neuro fuzzy network classification feature evaluation rule generation knowledge extraction and hybridization special emphasis is given to the integration of neuro fuzzy methods with rough sets and genetic algorithms gas to ensure more efficient recognition systems clear concise and

fully referenced neuro fuzzy pattern recognition features extensive examples and highlights key applications in speech machine learning medicine and forensic science it is an extremely useful resource for scientists and engineers in laboratories and industry as well as for anyone seeking up to date information on the advantages of neuro fuzzy pattern recognition in new computer technologies

Neural Network and Fuzzy Logic Applications in C/C+ *1994*

the extensively revised and updated edition provides a logical and easy to follow progression through c programming for two of the most popular technologies for artificial intelligence neural and fuzzy programming the authors cover theory as well as practical examples giving programmers a solid foundation as well as working examples with reusable code

Soft Computing *1999*

intelligent control considers non traditional modelling and control approaches to nonlinear systems fuzzy logic neural networks and evolutionary computing techniques are the main tools used the book presents a modular switching fuzzy logic controller where a pd type fuzzy controller is executed first followed by a pi type fuzzy controller thus improving the performance of the controller compared with a pid type fuzzy controller the advantage of the switching type fuzzy controller is that it uses one rule base thus minimises the rule base during execution a single rule base is developed by merging the membership functions for change of error of the pd type controller and sum of error of the pi type controller membership functions are then optimized using evolutionary algorithms since the two fuzzy controllers were executed in series necessary further tuning of the differential and integral scaling factors of the controller is then performed neural network based tuning for the scaling parameters of the fuzzy controller is then described and finally an evolutionary algorithm is applied to the neurally tuned fuzzy controller in which the sigmoidal function shape of the neural network is determined the important issue of stability is addressed and the text demonstrates empirically that the developed controller was stable within the operating range the text concludes with ideas for future research to show the reader the potential for further study in this area intelligent control will be of interest to researchers from engineering and computer science backgrounds working in the intelligent and adaptive control

Neuro-Fuzzy Pattern Recognition *1995*

illustrating how fuzzy logic and neural networks can be integrated into a model reference control context for real time control of multivariable systems this book provides an architecture which accommodates several popular learning reasoning paradigms

C++ Neural Networks and Fuzzy Logic *2013-11-29*

a general neural network based connectionist model called fuzzy neural network fnn is proposed in this book for the realization of a fuzzy logic control and decision system the fnn is a feedforward multi layered network which integrates the basic elements and functions of a traditional fuzzy logic controller into a connectionist structure which has distributed learning abilities in order to set up this proposed fnn the author recommends two complementary structure parameter learning algorithms a two phase hybrid learning algorithm and an on line supervised structure parameter learning algorithm both of these learning algorithms require exact supervised training data for learning in some real time applications exact training data may be expensive or even impossible to get to solve this reinforcement learning problem for real world applications a reinforcement fuzzy neural network rfnn is further proposed computer simulation examples are presented to illustrate the performance and applicability of the proposed fnn rfnn and their associated learning algorithms for various applications

Intelligent Control *1995*

this book comprises papers on diverse aspects of fuzzy logic neural networks and nature inspired optimization meta heuristics and their application in various areas such as intelligent control and robotics pattern recognition medical diagnosis time series prediction and optimization of complex problems the book is organized into seven main parts each with a collection of papers on a similar subject the first part presents new concepts and algorithms based on type 2 fuzzy logic for dynamic parameter adaptation in meta heuristics the second part discusses network theory and applications and includes papers describing applications of neural networks in diverse areas such as time series prediction and pattern recognition the third part addresses the theory and practice of meta heuristics in different areas of application while the fourth part describes diverse fuzzy logic applications in the control area which can be considered as intelligent controllers the next two parts explore applications in areas such as time series prediction and pattern recognition and new optimization and evolutionary algorithms and their applications respectively lastly the seventh part addresses the design and application of different hybrid intelligent systems

Fuzzy-neural Control 1994

fuzzy and neuro fuzzy systems in medicineprovides a thorough review of state of the art techniques and practices defines and explains relevant problems as well as provides solutions to these problems after an introduction the book progresses from one topic to another with a linear development from fundamentals to applications chapters discuss a historical perspective of fuzzy systems technology and neuro fuzzy systems technology in medicine and biology the relationship of fuzzy logic to the human brain analysis and classification of signals using fuzzy neuro fuzzy and wavelet methods wavelet analysis combined with neuro fuzzy systems in contouring gated spect images of ventricles a detailed application based on a knowledge based system that uses fuzzy techniques multispectral analysis and image processing algorithms applications in the field of dentistry a dedicated system for myocardial ischemia diagnosis a typical expert system used in intensive care units designing and tuning fuzzy rules for medical diagnosis knowledge processing decision making and control strategies combined with control methods in medical equipment current technological problems and trends in the neural and fuzzy hardware implementation field the well balanced chapters cover all the major fields in medicine and biomedical engineering including imaging prosthetics psychology medical equipment diagnosis and treatment

Neural Fuzzy Control Systems with Structure and Parameter Learning 2018-01-10

this book presents 14 rigorously reviewed revised papers selected from more than 50 submissions for the 1994 ieee nagoya university world wisepersons workshop www 94 held in august 1994 in nagoya japan the combination of approaches based on fuzzy logic neural networks and genetic algorithms are expected to open a new paradigm of machine learning for the realization of human like information processing systems the first six papers in this volume are devoted to the combination of fuzzy logic and neural networks four papers are on how to combine fuzzy logic and genetic algorithms four papers investigate challenging applications of fuzzy systems and of fuzzy genetic algorithms

Fuzzy Logic Augmentation of Neural and Optimization Algorithms: Theoretical Aspects and Real Applications *1998-09-30*

with increasing demands for high precision autonomous control over wide operating envelopes conventional control engineering approaches are unable to adequately deal with system complexity nonlinearities spatial and temporal parameter variations and with uncertainty intelligent control or self organising learning control is a new emerging discipline that is designed to deal with problems rather than being model based it is experiential based intelligent control is the amalgam of the disciplines of artificial intelligence systems theory and operations research it uses most recent experiences or evidence to improve its performance through a variety of learning schemas that for practical implementation must demonstrate rapid learning convergence be temporally stable be robust to parameter changes and internal and external disturbances it is shown in this book that a wide class of fuzzy logic and neural net based learning algorithms satisfy these conditions it is demonstrated that this class of intelligent controllers is based upon a fixed nonlinear mapping of the input sensor vector followed by an output layer linear mapping with coefficients that are updated by various first order learning laws under these conditions self organising fuzzy logic controllers and neural net controllers have common learning attributes a theme example of the navigation and control of an autonomous guided vehicle is included throughout together with a series of bench examples to demonstrate this new theory and its applicability

Fuzzy and Neuro-Fuzzy Systems in Medicine *1995-11-15*

in this book recent theoretical developments on fuzzy logic neural networks and optimization algorithms as well as their hybrid combinations are presented in addition the above mentioned methods are presented in application areas such as intelligent control and robotics pattern recognition medical diagnosis decision making time series prediction and optimization of complex problems the book contains a collection of papers focused on hybrid intelligent systems based on soft computing techniques there are a group of papers with the main theme of type 1 and type 2 fuzzy logic which basically consists of papers that propose new concepts and algorithms based on type 1 and type 2 fuzzy logic and their applications there also a group of papers that offer theoretical concepts and applications of meta heuristics in different areas another group of papers outlines diverse applications of fuzzy logic neural networks and hybrid intelligent systems in medical problems there are also some papers that present theory and practice of neural networks in different application areas in addition there are papers that offer theory and practice of optimization and evolutionary algorithms in different application areas finally there are a group of papers describing applications of fuzzy logic neural networks and meta heuristics in pattern recognition and classification problems

Advances in Fuzzy Logic, Neural Networks and Genetic Algorithms *1993*

the book provides an introduction to basic concepts as well as some recent advancements in fuzzy set theory approximate reasoning artificial neural networks and clustering methods these methodologies create together the so called soft computing which is part of a computational approach to system intelligence the book deals with an overview of fuzzy set theory foundations for approximate reasoning principles specific equivalence of inference results using logical conjunctive interpretations of if then rules supervised and unsupervised artificial neural networks a new generalized conditional fuzzy clustering method artificial neural networks based fuzzy inference system with parameterized consequences in if then rules matlab r m files implementation of neuro fuzzy systems detailed study of neuro fuzzy systems applications

Intelligent Control *2014-01-15*

this book describes hybrid intelligent systems using type 2 fuzzy logic and modular neural networks for pattern recognition applications hybrid intelligent systems combine several intelligent computing paradigms including fuzzy logic neural networks and bio inspired optimization algorithms which can be used to produce powerful pattern recognition systems type 2 fuzzy logic is an extension of traditional type 1 fuzzy logic that enables managing higher levels of uncertainty in complex real world problems which are of particular importance in the area of pattern recognition the book is organized in three main parts each containing a group of chapters built around a similar subject the first part consists of chapters with the main theme of theory and design algorithms which are basically chapters that propose new models and concepts which are the basis for achieving intelligent pattern recognition the second part contains chapters with the main theme of using type 2 fuzzy models and modular neural networks with the aim of designing intelligent systems for complex pattern recognition problems including iris ear face and voice recognition the third part contains chapters with the theme of evolutionary optimization of type 2 fuzzy systems and modular neural networks in the area of intelligent pattern recognition which includes the application of genetic algorithms for obtaining optimal type 2 fuzzy integration systems and ideal neural network architectures for solving problems in this area

Fuzzy Logic, Neural Networks, and Evolutionary Computation 2008

in this book recent developments on fuzzy logic neural networks and optimization algorithms as well as their hybrid combinations are presented in addition the above mentioned methods are applied to areas such as intelligent control and robotics pattern recognition medical diagnosis time series prediction and optimization of complex problems the book contains a collection of papers focused on hybrid intelligent systems based on soft computing techniques there are some papers with the main theme of type 1 and type 2 fuzzy logic which basically consists of papers that propose new concepts and algorithms based on type 1 and type 2 fuzzy logic and their applications there also some papers that offer theoretical concepts and applications of meta heuristics in different areas another group of papers describe diverse applications of fuzzy logic neural networks and hybrid intelligent systems in medical problems there are also some papers that present theory and practice of neural networks in different areas of application in addition there are papers that present theory and practice of optimization and evolutionary algorithms in different areas of application finally there are some papers describing applications of fuzzy logic neural networks and meta heuristics in pattern recognition and classification problems

Fuzzy logic and neural networks [electronic resource] *2023-06-12*

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

Hybrid Intelligent Systems Based on Extensions of Fuzzy Logic, Neural Networks and Metaheuristics *1997-09-01*

motor monitoring incipient fault detection and diagnosis are important and difficult topics in the engineering field these topics deal with motors ranging from small dc motors used in intensive care units to the huge motors used in nuclear power plants with proper machine monitoring and fault detection schemes improved safety and reliability can be achieved for different engineering system operations the importance of incipient fault detection can be found in the cost saving which can be obtained by detecting potential machine failures before they occur non invasive inexpensive and reliable fault detection techniques are often preferred by many engineers a large number of techniques such as expert system approaches and vibration analysis have been developed for motor fault detection purposes those techniques have achieved a certain degree of success however due to the complexity and importance of the systems there is a need to further improve existing fault detection techniques a major key to the success in fault detection is the ability to use appropriate technology to effectively fuse the relevant information to provide accurate and reliable results the advance in technology will provide opportunities for improving existing fault detection schemes with the maturing technology of artificial neural network and fuzzy logic the motor fault detection problem can be solved using an innovative approach based on measurements that are easily accessible without the need for rigorous mathematical models this approach can identify and aggregate the relevant information for accurate and reliable motor fault detection this book will introduce the neccessary concepts of neural network and fuzzy logic describe the advantages and challenges of using these technologies to solve motor fault detection problems and discuss several design considerations and methodologies in applying these techniques to motor incipient fault detection

Intelligent Hybrid Systems *2000-04-06*

soft computing encompasses various computational methodologies which unlike conventional algorithms are tolerant of imprecision uncertainty and partial truth soft computing technologies offer adaptability as a characteristic feature and thus permit the tracking of a problem through a changing environment besides some recent developments in areas like rough sets and probabilistic networks fuzzy logic evolutionary algorithms and artificial neural networks are core ingredients of soft computing which are all bio inspired and can easily be combined synergetically this book presents a well balanced integration of fuzzy logic evolutionary computing and neural information processing the three constituents are introduced to the reader systematically and brought together in differentiated combinations step by step the text was developed from courses given by the authors and offers numerous illustrations as

Fuzzy and Neuro-Fuzzy Intelligent Systems *2011-10-18*

Modular Neural Networks and Type-2 Fuzzy Systems for Pattern Recognition *2022-09-30*

New Perspectives on Hybrid Intelligent System Design based on Fuzzy Logic, Neural Networks and Metaheuristics *1998*

Fuzzy Logic and Expert Systems Applications *1997-11-26*

Methodologies Of Using Neural Network And Fuzzy Logic Technologies For Motor Incipient Fault Detection *2001-09-07*

Soft Computing 2014-01-15

Advances in Fuzzy Logic, Neural Networks and Genetic Algorithms

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