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KEY=NEURAL - KENDAL GEORGE

NEURAL NETWORKS, FUZZY SYSTEMS AND EVOLUTIONARY ALGORITHMS : SYNTHESIS AND APPLICATIONS

PHI Learning Pvt. Ltd. The second edition of this book provides a comprehensive introduction to a consortium of technologies underlying soft computing, an evolving branch of computational intelligence, which in recent years, has turned synonymous to it. The constituent technologies discussed comprise neural network (NN), fuzzy system (FS), evolutionary algorithm (EA), and a number of hybrid systems, which include classes such as neuro-fuzzy, evolutionary-fuzzy, and neuro-evolutionary systems. The hybridization of the technologies is demonstrated on architectures such as fuzzy backpropagation network (NN-FS hybrid), genetic algorithm-based backpropagation network (NN-EA hybrid),

simplified fuzzy ARTMAP (NN-FS hybrid), fuzzy associative memory (NN-FS hybrid), fuzzy logic controlled genetic algorithm (EA-FS hybrid) and evolutionary extreme learning machine (NN-EA hybrid) 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 the courses in soft computing at both the senior undergraduate and first-year postgraduate levels of computer science and engineering. It should also be of interest to researchers and technologists desirous of applying soft computing technologies to their respective fields of work.

Neural Networks, Fuzzy Logic, and Genetic Algorithms

Synthesis and Applications

Fuzzy Logic, Neural Networks, and Evolutionary Computation

IEEE/Nagoya-University World Wisepersons Workshop, Nagoya, Japan, November 14 - 15, 1995, Selected

Papers

Lecture Notes in Artificial Intelligence This book includes a selection of twelve carefully revised papers chosen from the papers accepted for presentation at the 4th IEEE/Nagoya-University World Wisepersons Workshop held in Nagoya in November 1995. The combining of the technologies of fuzzy logic, neural networks, and evolutionary computation is expected to open up a new paradigm of machine learning for the realization of human-like information generating systems. The excellent papers presented are organized in sections on fuzzy and evolutionary computation, fuzzy and learning automata, fuzzy and neural networks, genetic algorithms, and CAM-brain.

Neural Networks, Fuzzy Logic and Genetic Algorithms

Intelligent Hybrid Systems

Fuzzy Logic, Neural Networks, and Genetic Algorithms

Springer Science & Business Media 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.

Fusion of Neural Networks, Fuzzy Systems and Genetic Algorithms

Industrial Applications

CRC Press Artificial neural networks can mimic the biological information-processing mechanism in - a very limited sense. Fuzzy logic provides a basis for representing uncertain and imprecise knowledge and forms a basis for human reasoning. Neural networks display genuine promise in solving problems, but a definitive theoretical basis does not yet exist for their design. Fusion of Neural Networks, Fuzzy Systems and Genetic Algorithms integrates neural net, fuzzy system, and evolutionary computing in system design that enables its readers to handle complexity - offsetting the demerits of one paradigm by the merits of another. This book presents specific projects where fusion techniques have been applied. The chapters start with the design of a new fuzzy-neural controller. Remaining chapters discuss the application of expert systems, neural networks, fuzzy control, and evolutionary computing techniques in modern engineering systems. These specific applications include: direct frequency converters electro-hydraulic systems motor control toaster control speech recognition vehicle routing fault diagnosis Asynchronous Transfer Mode (ATM) communications networks telephones for hard-of-hearing people control of gas turbine aero-engines telecommunications systems design Fusion of Neural Networks, Fuzzy Systems and Genetic Algorithms covers the spectrum of applications - comprehensively demonstrating the advantages of fusion techniques in industrial applications.

Integrating Neural Networks, Fuzzy Logic and Genetic

Algorithms for Intelligent Control

Soft Computing

Integrating Evolutionary, Neural, and Fuzzy Systems

Springer Science & Business Media 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

Neural Networks, Fuzzy Logic and Genetic Algorithms in the Electric Supply Industry

Genetic Algorithms and Fuzzy Logic Systems

Soft Computing Perspectives

World Scientific Ever since fuzzy logic was introduced by Lotfi Zadeh in the mid-sixties and genetic algorithms by John Holland in the early seventies, these two fields widely been subjects of academic research the world over. During the last few years, they have been experiencing extremely rapid growth in the industrial world, where they have been shown to be very effective in solving real-world problems. These two substantial fields, together with neurocomputing techniques, are recognized as major parts of soft computing: a set of computing technologies already riding the waves of the next century to produce the human-centered intelligent systems of tomorrow; the collection of papers presented in this book shows the way. The book also contains an extensive bibliography on fuzzy logic and genetic algorithms.

Advances in Fuzzy Logic, Neural Networks and Genetic Algorithms

Compensatory Genetic Fuzzy Neural Networks and Their Applications

World Scientific This book presents a powerful hybrid intelligent system based on fuzzy logic, neural networks, genetic algorithms and related intelligent techniques. The new compensatory genetic fuzzy neural networks have been widely used in fuzzy control, nonlinear system modeling, compression of a fuzzy rule base, expansion of a sparse fuzzy rule base, fuzzy knowledge discovery, time series prediction, fuzzy games and pattern recognition. This effective soft computing system is able to perform both linguistic-word-level fuzzy reasoning and numerical-data-level information processing. The book also proposes various novel soft computing techniques. Contents:Fuzzy Compensation PrinciplesNormal Fuzzy Reasoning MethodologyCompensatory Genetic Fuzzy Neural NetworksFuzzy Knowledge Rediscovery in Fuzzy Rule BasesFuzzy Cart-Pole Balancing Control SystemsFuzzy Knowledge Compression and ExpansionHighly Nonlinear System Modeling and PredictionFuzzy Moves in Fuzzy GamesGenetic Neuro-Fuzzy Pattern

RecognitionConstructive Approach to Modeling Fuzzy Systems Readership: Graduate students, researchers and experts in fuzzy logic, neural networks and genetic algorithms, and their applications. Keywords:Neural Networks;Fuzzy Logic;Genetic Algorithms;Evolutionary Computation;Granular Computing;Pattern Recognition;Data Mining;Knowledge Discovery;Nonlinear System Modeling;Game Theory;Control;Uncertainty Management;Decision Making;Compensatory Genetic Fuzzy Neural Networks

Advances in Fuzzy Logic, Neural Networks and Genetic Algorithms

IEEE/Nagoya-University World Wisepersons Workshop, Nagoya, Japan, August 9 - 10, 1994. Selected Papers

Lecture Notes in Artificial Intelligence 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.

Advances in Fuzzy Logic, Neural Networks and Genetic

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Soft Computing in Water Resources Engineering

Artificial Neural Networks, Fuzzy Logic and Genetic Algorithms

WIT Press Engineers have attempted to solve water resources engineering problems with the help of empirical, regression-based and numerical models. Empirical models are not universal, nor are regression-based models. The numerical models are, on the other hand, physics-based but require substantial data measurement and parameter estimation. Hence, there is a need to employ models that are robust, user-friendly, and practical and that do not have the shortcomings of the existing methods. Artificial intelligence methods meet this need. Soft Computing in Water Resources Engineering introduces the basics of artificial neural networks (ANN), fuzzy logic (FL) and genetic algorithms

(GA). It gives details on the feed forward back propagation algorithm and also introduces neuro-fuzzy modelling to readers. Artificial intelligence method applications covered in the book include predicting and forecasting floods, predicting suspended sediment, predicting event-based flow hydrographs and sedimentographs, locating seepage path in an earth-fill dam body, and the predicting dispersion coefficient in natural channels. The author also provides an analysis comparing the artificial intelligence models and contemporary non-artificial intelligence methods (empirical, numerical, regression, etc.). The ANN, FL, and GA are fairly new methods in water resources engineering. The first publications appeared in the early 1990s and quite a few studies followed in the early 2000s. Although these methods are currently widely known in journal publications, they are still very new for many scientific readers and they are totally new for students, especially undergraduates. Numerical methods were first taught at the graduate level but are now taught at the undergraduate level. There are already a few graduate courses developed on AI methods in engineering and included in the graduate curriculum of some universities. It is expected that these courses, too, will soon be taught at the undergraduate levels.

Intelligent Control

A Hybrid Approach Based on Fuzzy Logic, Neural Networks and Genetic Algorithms

Springer 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.

Fuzzy Logic, Neural Network and Genetic Algorithms Handbook

Theory, Programming and Applications

The chapters in this handbook encompass areas such as live cellular oscillators, learning in biological neural networks, fractal associative memory, statistical theory of neural networks, parallel hardware architecture, Gabor and wavelet representations, chaotic and fuzzy function approximation. Applications include communications, tracking, flight control, colour correction, and manufacturing.

Introduction to Neural Networks, Fuzzy Logic & Genetic Algorithms

Theory & Applications

Control Theory

IET For students or professionals in science, math, or industry--with or without a background in control theory-- explains and illustrates the basic concepts underlying the theory, with references to more detailed treatments. Intended as a companion to more traditional approaches, begins with simple concepts such as feedback and stability, and advances to optimization, distributed parameter systems, and other complex ideas. Annotation copyrighted by Book News, Inc., Portland, OR

Hybrid Intelligent Systems for Pattern Recognition Using Soft Computing

An Evolutionary Approach for Neural Networks and Fuzzy Systems

Springer Science & Business Media This monograph describes new methods for intelligent pattern recognition using soft computing techniques including neural networks, fuzzy logic, and genetic algorithms. Hybrid intelligent systems that combine several soft computing techniques are needed due to the complexity of pattern recognition problems. Hybrid intelligent systems can have different architectures, which have an impact on the efficiency and accuracy of pattern recognition systems, to achieve the ultimate goal of pattern recognition. This book also shows results of the application of hybrid intelligent systems to real-world problems of face, fingerprint, and voice recognition. This monograph is intended to be a major reference for scientists and engineers applying new computational and mathematical tools to intelligent pattern recognition and can be also used as a textbook for graduate courses in soft computing, intelligent pattern recognition, computer vision, or applied artificial intelligence.

Soft Computing in Water Resources Engineering

Artifical Neural Networks, Fuzzy Logic and Genetic Algorithms

Engineers have attempted to solve water resources engineering problems with the help of empirical, regression-based and numerical models. Empirical models are not universal, nor are regression-based models. The numerical models are, on the other hand, physics-based but require substantial data measurement and parameter estimation. Hence, there is a need to employ models that are robust, user-friendly, and practical and that do not have the shortcomings of the existing methods. Artificial intelligence methods meet this need. Soft Computing in Water Resources Engineering introduces the basics of artificial neural networks (ANN), fuzzy logic (FL) and genetic algorithms (GA). It gives details on the feed forward back propagation algorithm and also introduces neuro-fuzzy modelling to readers. Artificial intelligence method applications covered in the book include predicting and forecasting floods, predicting suspended sediment, predicting event-based flow hydrographs and sedimentographs, locating seepage path in an earth-fill dam body, and the predicting dispersion coefficient in natural channels. The author also provides an analysis comparing the artificial intelligence models and contemporary non-artificial intelligence methods (empirical, numerical, regression, etc.). The ANN, FL, and GA are fairly new methods in water resources engineering. The first publications appeared in the early 1990s and quite a few studies followed in the early 2000s. Although these methods are currently widely known in journal publications, they are still very new for many scientific readers and they are totally new for students, especially undergraduates. Numerical methods were first taught at the graduate level but are now taught at the undergraduate level. There are already a few graduate courses developed on AI methods in engineering and included in the graduate curriculum of some universities. It is expected that these courses, too, will soon be taught at the undergraduate levels.

Modular Neural Networks and Type-2 Fuzzy Systems for Pattern Recognition

Springer Science & Business Media 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.

Intelligent Optimisation Techniques

Genetic Algorithms, Tabu Search, Simulated Annealing

and Neural Networks

Springer Science & Business Media This work gives a concise introduction to four important optimization techniques, presenting a range of applications drawn from electrical, manufacturing, mechanical, and systems engineering-such as the design of microstrip antennas, digital FIR filters, and fuzzy logic controllers. The book also contains the C programs used to implement the main techniques for those wishing to experiment with them.

Computational Intelligence

Synergies of Fuzzy Logic, Neural Networks and Evolutionary Computing

John Wiley & Sons 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.

Foundations of Generic Optimization

Volume 2: Applications of Fuzzy Control, Genetic Algorithms and Neural Networks

Springer Science & Business Media This is a comprehensive overview of the basics of fuzzy control, which also brings together some recent research results in soft computing, in particular fuzzy logic using genetic algorithms and neural networks. This book offers researchers not only a solid background but also a snapshot of the current state of the art in this field.

Fuzzy and Neural: Interactions and Applications

Physica The primary purpose of this book is to present information about selected topics on the interactions and applications of fuzzy + neural. Most of the discussion centers around our own research in these areas. Fuzzy + neural can mean many things: (1) approximations between fuzzy systems and neu ral nets (Chapter 4); (2) building hybrid neural nets to equal fuzzy systems (Chapter 5); (3) using neura.l nets to solve fuzzy problems (Chapter 6); (4) approximations between fuzzy neural nets and other fuzzy systems (Chap ter 8); (5) constructing hybrid fuzzy neural nets for certain fuzzy systems (Chapters 9, 10); or (6) computing with words (Chapter 11). This book is not intend to be used primarily as a text book for a course in fuzzy + neural because we have not included problems at the end of each chapter, we have omitted most proofs (given in the references), and we have given very few references. We wanted to keep the mathematical prerequisites to a minimum so all longer, involved, proofs were omitted. Elementary dif ferential calculus is the only prerequisite needed since we do mention partial derivatives once or twice.

Soft Computing in Human-Related Sciences

CRC Press Hard boundaries have traditionally existed between such fields as fuzzy systems, neural networks, genetic algorithms, chaotic systems and expert systems. Gradually those boundaries are tending to vanish and "soft computing"-based systems that mix these different approaches have begun to emerge. Soft Computing Techniques in Human-Related Sciences focuses on the use of novel techniques such as artificial neural networks, fuzzy logic and genetic algorithms to solve practical problems related to humans: their activities, health and social needs. This volume illustrates and presents in an organized manner some of the recent progress in the applications of soft computing to fields related to social science, medical science, psychology, psychiatry , management of health and community services, and humanoid robots. Soft Computing Techniques in Human-Related Sciences begins with an introductory chapter to aid newcomers with the basic concepts, and progresses to the methodology of the use of soft computing in robotics, prosthetics, medicine, psycchology and man-machine interaction.

Hierarchical Modular Granular Neural Networks with Fuzzy Aggregation

Springer In this book, a new method for hybrid intelligent systems is proposed. The proposed method is based on a granular computing approach applied in two levels. The techniques used and combined in the proposed method are modular neural networks (MNNs) with a Granular Computing (GrC) approach, thus resulting in a new concept of MNNs; modular granular neural networks (MGNNs). In addition fuzzy logic (FL) and hierarchical genetic algorithms (HGAs) are techniques used in this research work to improve results. These techniques are chosen because in other works have demonstrated to be a good option, and in the case of MNNs and HGAs, these techniques allow to improve the results obtained than with their conventional versions; respectively artificial neural networks and genetic algorithms.

Soft Computing in Systems and Control Technology

World Scientific Soft computing is a branch of computing which, unlike hard computing, can deal with uncertain, imprecise and inexact data. The three constituents of soft computing are fuzzy-logic-based computing, neurocomputing, and genetic algorithms. Fuzzy logic contributes the capability of approximate reasoning, neurocomputing offers function approximation and learning capabilities, and genetic algorithms provide a methodology for systematic random search and optimization. These three capabilities are combined in a complementary and synergetic fashion. This book presents a cohesive set of contributions dealing with important issues and applications of soft computing in systems and control technology. The contributions include state-of-the-art material, mathematical developments, fresh results, and how-to-do issues. Among the problems studied via neural, fuzzy, neurofuzzy and genetic methodologies are: data fusion, reinforcement learning, approximation properties, multichannel imaging, signal processing, system optimization, gaming, and several forms of control. The book can serve as a reference for researchers and practitioners in the field. Readers can find in it a large amount of useful and timely information, and thus save considerable effort in searching for other scattered literature. Contents:Neural Networks in System Identification and Control:Supervised Learning in Multilayer Perceptrons: The Back-Propagation Algorithm (S G Tzafestas & Y Anthopoulos)Identification of Two-Dimensional State Space Discrete Systems Using Neural Networks (D Wang & A Zilouchian)Neural Networks for Control (R J Mitchell)Neuro-Based Adaptive Regulator (T Tsuji et al.)Local Model Networks and Self-Tuning Predictive Control (P J Gawthrop & E Ronco)Fuzzy and Neuro-Fuzzy Systems in Modeling, Control and Robot Path Planning:An On-Line Self Constructing Fuzzy Modeling Architecture Based on Neural and Fuzzy Concepts and Techniques (S G Tzafestas & K C Zikidis)Neuro-Fuzzy Model Based Control (D Matko et al.)Fuzzy and Neurofuzzy Approaches to Mobile Robot Path and Motion Planning Under Uncertainty (C S Tzafestas & S G Tzafestas)Genetic-Evolutionary Algorithms:A Tutorial Overview of Genetic Algorithms and Their Applications (S G Tzafestas et al.)Results from a Variety of Genetic Algorithm Applications Showing the Robustness of the Approach (W D Potter et al.)Evolutionary Algorithms in Computer-Aided Design of Integrated Circuits (R Drechsler et al.)Soft Computing Applications:Soft Data Fusion (C G Looney & Y Varol)Application of Neural Networks to Computer Gaming (N Baba)Coherent Neural Networks and Their Applications to Control and Signal Processing (A Hirose)Neural, Fuzzy and Evolutionary Reinforcement Learning Systems: An Application Case Study (D A Linkens & H O Nyongesa)Neural Networks in Industrial and Environmental Applications (G C Smith & C L Wrobel) Readership:

Researchers and practitioners in systems and control engineering. Keywords:

Type-2 Fuzzy Neural Networks and Their Applications

Springer This book deals with the theory, design principles, and application of hybrid intelligent systems using type-2 fuzzy sets in combination with other paradigms of Soft Computing technology such as Neuro-Computing and Evolutionary Computing. It provides a self-contained exposition of the foundation of type-2 fuzzy neural networks and presents a vast compendium of its applications to control, forecasting, decision making, system identification and other real problems. Type-2 Fuzzy Neural Networks and Their Applications is helpful for teachers and students of universities and colleges, for scientists and practitioners from various fields such as control, decision analysis, pattern recognition and similar fields.

Foundations of Neural Networks, Fuzzy Systems, and Knowledge Engineering

Marcel Alencar Neural networks and fuzzy systems are different approaches to introducing human-like reasoning into expert systems. This text is the first to combine the study of these two subjects, their basics and their use, along with symbolic AI methods to build comprehensive artificial intelligence systems. In a clear and accessible style, Kasabov describes rule- based and connectionist techniques and then their combinations, with fuzzy logic included, showing the application of the different techniques to a set of simple prototype problems, which makes comparisons possible. A particularly strong feature of the text is that it is filled with applications in engineering, business, and finance. AI problems that cover most of the application-oriented research in the field (pattern recognition, speech and image processing, classification, planning, optimization, prediction, control, decision making, and game simulations) are discussed and illustrated with concrete examples. Intended both as a text for advanced undergraduate and postgraduate students as well as a reference for researchers in the field of knowledge engineering, Foundations of Neural Networks, Fuzzy Systems, and Knowledge Engineering has chapters structured for various levels of teaching and includes original work by the author along with the classic material. Data sets for the examples in the book as well as an integrated software environment that can be used to solve the problems and do the exercises at the end of each

chapter are available free through anonymous ftp.

Developments in Soft Computing

Springer Science & Business Media Soft Computing has come of age. In particular, Artificial Neural Networks, Fuzzy Logic and Evolutionary Computing now play an important role in many domains where traditional techniques have been found wanting. As this volume confirms, hybrid solutions that combine more than one of the Soft Computing approaches are particularly successful in many problem areas. This volume contains papers presented at the International Conference on Recent Advances in Soft Computing 2000 at De Montfort University in Leicester. The contributions cover both theoretical developments and practical applications in the various areas of Soft Computing.

Artificial Neural Nets and Genetic Algorithms

Proceedings of the International Conference in Roanne, France, 2003

Springer Science & Business Media The 2003 edition of ICANNGA marks a milestone in this conference series, because it is the tenth year of its existence. The series began in 1993 with the inaugural conference at Innsbruck in Austria. At that first conference, the organisers decided to organise a similar scientific meeting every two years. As a result, conferences were organised at Ales in France (1995), Norwich in England (1997), Portoroz in Slovenia (1999) and Prague in the Czech Republic (2001). It is a great honour that the conference is taking place in France for the second time. Each edition of ICANNGA has been special and had its own character. Not only that, participants have been able to sample the life and local culture in five different European coun tries. Originally limited to neural networks and genetic algorithms the conference has broadened its outlook over the past ten years and now includes papers on soft computing and artificial intelligence in general. This is one of the reasons why the reader will find papers on fuzzy logic and various other topics not directly related to neural networks or genetic algorithms included in these proceedings. We have, however, kept the same name, "International Conference on Artificial Neural Networks and Genetic

Algorithms". All of the papers were sorted into one of six principal categories: neural network theory, neural network applications, genetic algorithm and evolutionary computation theory, genetic algorithm and evolutionary computation applications, fuzzy and soft computing theory, fuzzy and soft computing applications.

NEURAL NETWORKS, FUZZY LOGIC AND GENETIC ALGORITHM

SYNTHESIS AND APPLICATIONS (WITH CD)

PHI Learning Pvt. Ltd. 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.

Soft Computing in Case Based Reasoning

Springer Science & Business Media This text demonstrates how various soft computing tools can be applied to design and develop methodologies and systems with case based reasoning, that is, for real-life decision-making or recognition

problems. Comprising contributions from experts, it introduces the basic concepts and theories, and includes many reports on real-life applications. This book is of interest to graduate students and researchers in computer science, electrical engineering and information technology, as well as researchers and practitioners from the fields of systems design, pattern recognition and data mining.

New Frontiers in Computational Intelligence and Its Applications

IOS Press Computational Intelligence is a broad and active research area that is growing rapidly due to the many successful applications of these new techniques in very diverse problems. Many industries have benefited from adopting this technology. The increased number of patents and diverse range of products developed using computational intelligence methods is evidence of this fact. The goal of this book is to provide highlights of the current research in computational intelligence area. The book consists of research papers in the fields of neural networks, fuzzy logic, evolutionary computing, hybrid evolutionary computing-fuzzy logic systems, hybrid neural networks-evolutionary computing and fuzzy logic systems, image processing and vision, advances in robotics, control and manufacturing, and rough sets.

Hybrid Systems

Genetic Algorithms, Neural Networks, and Fuzzy Logic

Hybrid Intelligent Engineering Systems

World Scientific This book on hybrid intelligent engineering systems is unique, in the sense that it presents the integration of expert systems, neural networks, fuzzy systems, genetic algorithms, and chaos engineering. It shows that these new techniques enhance the capabilities of one another. A number of hybrid systems for solving

engineering problems are presented. Contents: An Introduction to Intelligent Systems (L C Jain & R Vemuri)Integration of Fuzzy Systems and Neural Networks, and Fuzzy Systems and Genetic Algorithms (H Takagi & M A Lee)Neuro-Expert Architecture and Applications in Diagnostic/Classification Domains (L R Medsker)Genetic Learning in Fuzzy Control (C L Karr & L C Jain)Cases in Geno-Fuzzy Control (C L Karr & L C Jain)Evolutionary Engineering and Applications (H de Garis)Fusion Technology of Neuro, Fuzzy, GA and Chaos Theory and Applications (R Katayama et al.) Readership: General audience, undergraduates, and researchers interested in artificial intelligence and systems & knowledge engineering. keywords:Intelligent Systems;Intelligent Industrial Applications;Neural Networks;Fuzzy Systems;Evolutionary Algorithms;Genetic Algorithms;Chaos Theory;Hybrid Systems;Fusion of Intelligent Systems

Fuzzy Logic Augmentation of Neural and Optimization Algorithms: Theoretical Aspects and Real Applications

Springer 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 And Neural Approaches in Engineering

Wiley-Interscience Neural networks and fuzzy systems represent two distinct technologies that deal with uncertainty. This definitive book presents the fundamentals of both technologies, and demonstrates how to combine the unique capabilities of these two technologies for the greatest advantage. Steering clear of unnecessary mathematics, the book highlights a wide range of dynamic possibilities and offers numerous examples to illuminate key concepts. It also explores the value of relating genetic algorithms and expert systems to fuzzy and neural technologies.