Anfis Matlab Tutorial

Fuzzy Logic Toolbox for Use with MATLAB.Advances in Data Analysis with Computational Intelligence MethodsEnvironmental Systems Analysis with MATLAB®FPGA-Based Embedded System Developer's GuideHigh Performance Control of AC Drives with Matlab / Simulink ModelsFuzzy Control, Estimation and DiagnosisCuckoo Search and Firefly AlgorithmMATLAB Neural Network Toolbox: User's GuideNumerical Computing with MATLABFuzzy Techniques for Decision Making 2018Intelligent Control Systems Using Soft Computing MethodologiesAdaptive Signal ProcessingVisual Control of RobotsProceedings of the International Conference of Mechatronics and Cyber-MixMechatronics - 2017Tutorial CEPAT & MUDAH FUZZY LOGIC dengan MATLABEvolving Connectionist SystemsFlood Forecasting Using Machine Learning MethodsData Fusion MathematicsFuzzy Systems EngineeringData Clustering: Theory, Algorithms, and Applications, Second EditionPractical Computer Vision Applications Using Deep Learning with CNNsModeling of Tropospheric Delays Using ANFISEvolving Connectionist SystemsApplications from Engineering with MATLAB ConceptsFunctional Analysis in Modern Applied Mathematics10th International Conference on Theory and Application of Soft Computing, Computing with Words and Perceptions - ICSCCW-2019Fourier Ptychographic ImagingComputational Intelligence ParadigmsBiomimicry for Optimization, Control, and AutomationEAI International Conference on Big Data Innovation for Sustainable Cognitive ComputingClassification and Regression TreesIntroduction to Genetic AlgorithmsData Mining and Big DataQuantitative TradingHigh Performance Programming for Soft ComputingHybrid Modeling in Process IndustriesComputer Vision and Fuzzy-neural SystemsIndustrial Applications of Fuzzy ControlComputational IntelligencePermanent Magnet Synchronous Machines

Fuzzy Logic Toolbox for Use with MATLAB.

"While institutional traders continue to implement quantitative (or algorithmic) trading, many independent traders have wondered if they can still challenge powerful industry professionals at their own game? The answer is "yes," and in Quantitative Trading, Dr. Ernest Chan, a respected independent trader and consultant, will show you how. Whether you're an independent "retail" trader looking to start your own quantitative trading business or an individual who aspires to work as a quantitative trader at a major financial institution, this practical guide contains the information you need to succeed"--Resource description page.

Advances in Data Analysis with Computational Intelligence Methods

This book offers a basic introduction to genetic algorithms. It provides a detailed explanation of genetic algorithm concepts and examines numerous genetic algorithm optimization problems. In addition, the book presents implementation of optimization problems using C and C++ as well as simulated solutions for genetic algorithm problems using MATLAB 7.0. It also includes application case studies on genetic algorithms in emerging fields.

Environmental Systems Analysis with MATLAB®

FPGA-Based Embedded System Developer's Guide

A comprehensive guide to understanding AC machines with exhaustive simulation models to practice design and control Nearly seventy percent of the electricity generated worldwide is used by electrical motors. Worldwide, huge research efforts are being made to develop commercially viable three- and multi-phase motor drive systems that are economically and technically feasible. Focusing on the most popular AC machines used in industry – induction machine and permanent magnet synchronous machine – this book illustrates advanced control techniques and topologies in practice and recently deployed. Examples are drawn from important techniques including Vector Control, Direct Torque Control, Nonlinear Control, Predictive Control, multi-phase drives and multilevel inverters. Key features include: systematic coverage of the advanced concepts of AC motor drives with and without output filter; discussion on the modelling, analysis and control of three- and multi-phase AC machine drives, including the recently developed multi-phase-phase drive system and double fed induction machine; description of model predictive control applied to power converters and AC drives, illustrated together with their simulation models; end-of-chapter questions, with answers and PowerPoint slides available on the companion website www.wiley.com/go/aburub_control This book integrates a diverse range of topics into one useful volume, including most the latest developments. It provides an effective guideline for students and professionals on many vital electric drives aspects. It is an advanced textbook for final year undergraduate and graduate students, and researchers in power electronics, electric drives and motor control. It is also a handy tool for specialists and practicing engineers wanting to develop and verify their own algorithms and techniques.

High Performance Control of AC Drives with Matlab / Simulink Models

Deploy deep learning applications into production across multiple platforms. You will work on computer vision applications that use the convolutional neural network (CNN) deep learning model and Python. This book starts by explaining the traditional machine-learning pipeline, where you will analyze an image dataset. Along the way you will cover artificial neural networks (ANNs), building one from scratch in Python, before optimizing it using genetic algorithms. For automating the process, the book highlights the limitations of traditional hand-crafted features for computer vision and why the CNN deep-learning model is the state-of-art solution. CNNs are discussed from scratch to demonstrate how they are different and more efficient than the fully connected ANN (FCNN). You will implement a CNN in Python to give you a full understanding of the model. After consolidating the basics, you will use TensorFlow to build a practical image-recognition model that you will deploy to a web server using Flask, making it accessible over the Internet. Using Kivy and NumPy, you will create cross-platform data science applications with low overheads. This book will help you apply deep learning and computer vision concepts from scratch, step-by-step from conception to production. What

You Will Learn Understand how ANNs and CNNs work Create computer vision applications and CNNs from scratch using Python Follow a deep learning project from conception to production using TensorFlow Use NumPy with Kivy to build cross-platform data science applications Who This Book Is ForData scientists, machine learning and deep learning engineers, software developers.

Fuzzy Control, Estimation and Diagnosis

This book investigates tropospheric delays, one of the main error sources in Global Navigation Satellite Systems (GNSS), and its impact plays a crucial role in near real-time weather forecasting. Accessibility and accurate estimation of this parameter are essential for weather and climate research. Advances in GNNS application has allowed the measurements of Zenith Tropospheric Delay (ZTD) in all weather conditions and on a global scale with fine temporal and spatial resolution. However, GPS data are not always available for a full 24-hour period. Using a soft computing technique such as Adaptive Neuro-Fuzzy Inference System (ANFIS) as a new alternative, the ZTD can be determined by using the surface meteorological data as inputs. The estimation and prediction of ZTD value are presented in this book.

Cuckoo Search and Firefly Algorithm

Nature-inspired algorithms such as cuckoo search and firefly algorithm have become popular and widely used in recent years in many applications. These algorithms are flexible, efficient and easy to implement. New progress has been made in the last few years, and it is timely to summarize the latest developments of cuckoo search and firefly algorithm and their diverse applications. This book will review both theoretical studies and applications with detailed algorithm analysis, implementation and case studies so that readers can benefit most from this book. Application topics are contributed by many leading experts in the field. Topics include cuckoo search, firefly algorithm, algorithm analysis, feature selection, image processing, travelling salesman problem, neural network, GPU optimization, scheduling, queuing, multi-objective manufacturing optimization, semantic web service, shape optimization, and others. This book can serve as an ideal reference for both graduates and researchers in computer science, evolutionary computing, machine learning, computational intelligence, and optimization, as well as engineers in business intelligence, knowledge management and information technology.

MATLAB Neural Network Toolbox: User's Guide

Data clustering, also known as cluster analysis, is an unsupervised process that divides a set of objects into homogeneous groups. Since the publication of the first edition of this monograph in 2007, development in the area has exploded, especially in clustering algorithms for big data and open-source software for cluster analysis. This second edition reflects these new developments, covers the basics of data clustering, includes a list of popular clustering algorithms, and provides program code that helps users implement clustering algorithms. Data Clustering: Theory, Algorithms and Applications, Second Edition will be of interest

to researchers, practitioners, and data scientists as well as undergraduate and graduate students.

Numerical Computing with MATLAB

Interest in permanent magnet synchronous machines (PMSMs) is continuously increasing worldwide, especially with the increased use of renewable energy and the electrification of transports. This book contains the successful submissions of fifteen papers to a Special Issue of Energies on the subject area of "Permanent Magnet Synchronous Machines". The focus is on permanent magnet synchronous machines and the electrical systems they are connected to. The presented work represents a wide range of areas. Studies of control systems, both for permanent magnet synchronous machines and for brushless DC motors, are presented and experimentally verified. Design studies of generators for wind power, wave power and hydro power are presented. Finite element method simulations and analytical design methods are used. The presented studies represent several of the different research fields on permanent magnet machines and electric drives.

Fuzzy Techniques for Decision Making 2018

This textbook explains the principles of fuzzy systems in some depth together with information useful in realizing them within computational processes. The various algorithms and example problem solutions are a well-balanced and pertinent aid for research projects, laboratory work and graduate study. In addition to its worked examples, the book also uses end-of-chapter exercises as an instructional aid with a downloadable solutions manual available to instructors. The content of the book is developed and extended from material taught for four years in the author's classes. The text provides a broad overview of fuzzy control, estimation and fault diagnosis. It ranges over various classes of target system and modes of control and then turns to filtering, stabilization, and fault detection and diagnosis. Applications, simulation tools and an appendix on algebraic inequalities complete a unified approach to the analysis of single and interconnected fuzzy systems. Fuzzy Control, Estimation and Fault Detection is a guide for final-year undergraduate and graduate students of electrical and mechanical engineering, computer science and information technology, and will also be instructive for professionals in the information technology sector.

Intelligent Control Systems Using Soft Computing Methodologies

This book is a tribute to Professor Jacek Żurada, who is best known for his contributions to computational intelligence and knowledge-based neurocomputing. It is dedicated to Professor Jacek Żurada, Full Professor at the Computational Intelligence Laboratory, Department of Electrical and Computer Engineering, J.B. Speed School of Engineering, University of Louisville, Kentucky, USA, as a token of appreciation for his scientific and scholarly achievements, and for his longstanding service to many communities, notably the computational intelligence community, in particular neural networks, machine learning, data analyses and data mining, but also the fuzzy logic and evolutionary computation communities, to name but a

few. At the same time, the book recognizes and honors Professor Żurada's dedication and service to many scientific, scholarly and professional societies, especially the IEEE (Institute of Electrical and Electronics Engineers), the world's largest professional technical professional organization dedicated to advancing science and technology in a broad spectrum of areas and fields. The volume is divided into five major parts, the first of which addresses theoretic, algorithmic and implementation problems related to the intelligent use of data in the sense of how to derive practically useful information and knowledge from data. In turn, Part 2 is devoted to various aspects of neural networks and connectionist systems. Part 3 deals with essential tools and techniques for intelligent technologies in systems modeling and Part 4 focuses on intelligent technologies in decision-making, optimization and control, while Part 5 explores the applications of intelligent technologies.

Adaptive Signal Processing

The book presents a collection of MATLAB-based chapters of various engineering background. Instead of giving exhausting amount of technical details, authors were rather advised to explain relations of their problems to actual MATLAB concepts. So, whenever possible, download links to functioning MATLAB codes were added and a potential reader can do own testing. Authors are typically scientists with interests in modeling in MATLAB. Chapters include image and signal processing, mechanics and dynamics, models and data identification in biology, fuzzy logic, discrete event systems and data acquisition systems.

Visual Control of Robots

This title introduces the underlying theory and demonstrates practical applications in different process industries using hybrid modeling. It reviews hybrid modeling approach applicability in wide range of process industries, recommends how to increase hybrid model performance and throw Insights into cost efficient practices in modeling techniques Discusses advance process operation maximizing the benefits of available process knowledge and Includes real-life and practical case studies

Proceedings of the International Conference of Mechatronics and Cyber-MixMechatronics - 2017

CD-ROM contains: BackProp -- Data files -- Display -- Images -- MATLAB examples.

Tutorial CEPAT & MUDAH FUZZY LOGIC dengan MATLAB

This book demonstrates the concept of Fourier ptychography, a new imaging technique that bypasses the resolution limit of the employed optics. In particular, it transforms the general challenge of high-throughput, high-resolution imaging from one that is coupled to the physical limitations of the optics to one that is solvable through computation. Demonstrated in a tutorial form and providing many MATLAB® simulation examples for the reader, it also discusses the experimental implementation and recent developments of Fourier ptychography. This book will

be of interest to researchers and engineers learning simulation techniques for Fourier optics and the Fourier ptychography concept.

Evolving Connectionist Systems

Zadeh's fuzzy set theory incorporates the impreciseness of data and evaluations, by imputting the degrees by which each object belongs to a set. Its success fostered theories that codify the subjectivity, uncertainty, imprecision, or roughness of the evaluations. Their rationale is to produce new flexible methodologies in order to model a variety of concrete decision problems more realistically. This Special Issue garners contributions addressing novel tools, techniques and methodologies for decision making (inclusive of both individual and group, single- or multi-criteria decision making) in the context of these theories. It contains 38 research articles that contribute to a variety of setups that combine fuzziness, hesitancy, roughness, covering sets, and linguistic approaches. Their ranges vary from fundamental or technical to applied approaches.

Flood Forecasting Using Machine Learning Methods

Data Fusion Mathematics

This proceeding features papers discussing big data innovation for sustainable cognitive computing. The papers feature detail on cognitive computing and its self-learning systems that use data mining, pattern recognition and natural language processing (NLP) to mirror the way the human brain works. This international conference focuses on cognitive computing technologies, from knowledge representation techniques and natural language processing algorithms to dynamic learning approaches. Topics covered include Data Science for Cognitive Analysis, Real-Time Ubiquitous Data Science, Platform for Privacy Preserving Data Science, and Internet-Based Cognitive Platform. The EAI International Conference on Big Data Innovation for Sustainable Cognitive Computing (BDCC 2018), took place on 13 – 15 December 2018 in Coimbatore, India.

Fuzzy Systems Engineering

Data Clustering: Theory, Algorithms, and Applications, Second Edition

This second edition of the must-read work in the field presents generic computational models and techniques that can be used for the development of evolving, adaptive modeling systems, as well as new trends including computational neuro-genetic modeling and quantum information processing related to evolving systems. New applications, such as autonomous robots, adaptive artificial life systems and adaptive decision support systems are also covered.

Practical Computer Vision Applications Using Deep Learning

with CNNs

Explore the inner workings of environmental processes using a mathematical approach. Environmental Systems Analysis with MATLAB® combines environmental science concepts and system theory with numerical techniques to provide a better understanding of how our environment works. The book focuses on building mathematical models of environmental systems, and using these models to analyze their behaviors. Designed with the environmental professional in mind, it offers a practical introduction to developing the skills required for managing environmental modeling and data handling. The book follows a logical sequence from the basic steps of model building and data analysis to implementing these concepts into working computer codes, and then on to assessing their results. It describes data processing (rarely considered in environmental analysis); outlines the tools needed to successfully analyze data and develop models, and moves on to real-world problems. The author illustrates in the first four chapters the methodological aspects of environmental systems analysis, and in subsequent chapters applies them to specific environmental concerns. The accompanying software bundle is freely downloadable from the book web site. It follows the chapters sequence and provides a hands-on experience, allowing the reader to reproduce the figures in the text and experiment by varying the problem setting. A basic MATLAB literacy is required to get the most out of the software. Ideal for coursework and self-study, this offering: Deals with the basic concepts of environmental modeling and identification, both from the mechanistic and the data-driven viewpoint Provides a unifying methodological approach to deal with specific aspects of environmental modeling: population dynamics, flow systems, and environmental microbiology Assesses the similarities and the differences of microbial processes in natural and man-made environments Analyzes several aquatic ecosystems' case studies Presents an application of an extended Streeter & Phelps (S&P) model Describes an ecological method to estimate the bioavailable nutrients in natural waters Considers a lagoon ecosystem from several viewpoints, including modeling and management, and more

Modeling of Tropospheric Delays Using ANFIS

Fills the Existing Gap of Mathematics for Data Fusion Data fusion (DF) combines large amounts of information from a variety of sources and fuses this data algorithmically, logically and, if required intelligently, using artificial intelligence (AI). Also, known as sensor data fusion (SDF), the DF fusion system is an important component for use in various applications that include the monitoring of vehicles, aerospace systems, large-scale structures, and large industrial automation plants. Data Fusion Mathematics: Theory and Practice offers a comprehensive overview of data fusion, and provides a proper and adequate understanding of the basic mathematics directly related to DF. The material covered can be used for evaluation of the performances of any designed and developed DF systems. It tries to answer whether unified data fusion mathematics can evolve from various disparate mathematical concepts, and highlights mathematics that can add credibility to the data fusion process. Focuses on Mathematical Tools That Use Data Fusion This text explores the use of statistical/probabilistic signal/image processing, filtering, component analysis, image algebra, decision making, and neuro-FL–GA paradigms in studying, developing and validating data fusion

processes (DFP). It covers major mathematical expressions, and formulae and equations as well as, where feasible, their derivations. It also discusses SDF concepts, DF models and architectures, aspects and methods of type 1 and 2 fuzzy logics, and related practical applications. In addition, the author covers soft computing paradigms that are finding increasing applications in multisensory DF approaches and applications. This book: Explores the use of interval type 2 fuzzy logic and ANFIS in DF Covers the mathematical treatment of many types of filtering algorithms, target-tracking methods, and kinematic DF methods Presents single and multi-sensor tracking and fusion mathematics Considers specific DF architectures in the context of decentralized systems Discusses information filtering, Bayesian approaches, several DF rules, image algebra and image fusion, decision fusion, and wireless sensor network (WSN) multimodality fusion Data Fusion Mathematics: Theory and Practice incorporates concepts, processes, methods, and approaches in data fusion that can help you with integrating DF mathematics and achieving higher levels of fusion activity, and clarity of performance. This text is geared toward researchers, scientists, teachers and practicing engineers interested and working in the multisensor data fusion area.

Evolving Connectionist Systems

Nowadays, the degree and scale of flood hazards has been massively increasing as a result of the changing climate, and large-scale floods jeopardize lives and properties, causing great economic losses, in the inundation-prone areas of the world. Early flood warning systems are promising countermeasures against flood hazards and losses. A collaborative assessment according to multiple disciplines, comprising hydrology, remote sensing, and meteorology, of the magnitude and impacts of flood hazards on inundation areas significantly contributes to model the integrity and precision of flood forecasting. Methodologically oriented countermeasures against flood hazards may involve the forecasting of reservoir inflows, river flows, tropical cyclone tracks, and flooding at different lead times and/or scales. Analyses of impacts, risks, uncertainty, resilience, and scenarios coupled with policy-oriented suggestions will give information for flood hazard mitigation. Emerging advances in computing technologies coupled with big-data mining have boosted data-driven applications, among which Machine Learning technology, with its flexibility and scalability in pattern extraction, has modernized not only scientific thinking but also predictive applications. This book explores recent Machine Learning advances on flood forecast and management in a timely manner and presents interdisciplinary approaches to modelling the complexity of flood hazards-related issues, with contributions to integrative solutions from a local, regional or global perspective.

Applications from Engineering with MATLAB Concepts

A revised textbook for introductory courses in numerical methods, MATLAB and technical computing, which emphasises the use of mathematical software.

Functional Analysis in Modern Applied Mathematics

The book covers various aspects of VHDL programming and FPGA interfacing with

examples and sample codes giving an overview of VLSI technology, digital circuits design with VHDL, programming, components, functions and procedures, and arithmetic designs followed by coverage of the core of external I/O programming, algorithmic state machine based system design, and real-world interfacing examples.

10th International Conference on Theory and Application of Soft Computing, Computing with Words and Perceptions - ICSCCW-2019

In recent years, intelligent control has emerged as one of the most active and fruitful areas of research and development. Until now, however, there has been no comprehensive text that explores the subject with focus on the design and analysis of biological and industrial applications. Intelligent Control Systems Using Soft Computing Methodologies does all that and more. Beginning with an overview of intelligent control methodologies, the contributors present the fundamentals of neural networks, supervised and unsupervised learning, and recurrent networks. They address various implementation issues, then explore design and verification of neural networks for a variety of applications, including medicine, biology, digital signal processing, object recognition, computer networking, desalination technology, and oil refinery and chemical processes. The focus then shifts to fuzzy logic, with a review of the fundamental and theoretical aspects, discussion of implementation issues, and examples of applications, including control of autonomous underwater vehicles, navigation of space vehicles, image processing, robotics, and energy management systems. The book concludes with the integration of genetic algorithms into the paradigm of soft computing methodologies, including several more industrial examples, implementation issues, and open problems and open problems related to intelligent control technology. Suitable as a textbook or a reference, Intelligent Control Systems explores recent advances in the field from both the theoretical and the practical viewpoints. It also integrates intelligent control design methodologies to give designers a set of flexible, robust controllers and provide students with a tool for solving the examples and exercises within the book.

Fourier Ptychographic Imaging

This text addresses the application of machine vision as a sensor for high-performance control of robot manipulator position. In order to achieve high-performance it is argued that it is necessary to have accurate dynamical models of the system to be controlled (the robot) and the sensor (the camera and vision system). The text provides supporting theory, experimentation and practical coverage of the topic.

Computational Intelligence Paradigms

Many methods and models have been proposed for solving difficult problems such as prediction, planning and knowledge discovery in application areas such as bioinformatics, speech and image analysis. Most, however, are designed to deal with static processes which will not change over time. Some processes - such as

speech, biological information and brain signals - are not static, however, and in these cases different models need to be used which can trace, and adapt to, the changes in the processes in an incremental, on-line mode, and often in real time. This book presents generic computational models and techniques that can be used for the development of evolving, adaptive modelling systems. The models and techniques used are connectionist-based (as the evolving brain is a highly suitable paradigm) and, where possible, existing connectionist models have been used and extended. The first part of the book covers methods and techniques, and the second focuses on applications in bioinformatics, brain study, speech, image, and multimodal systems. It also includes an extensive bibliography and an extended glossary. Evolving Connectionist Systems is aimed at anyone who is interested in developing adaptive models and systems to solve challenging real world problems in computing science or engineering. It will also be of interest to researchers and students in life sciences who are interested in finding out how information science and intelligent information processing methods can be applied to their domains.

Biomimicry for Optimization, Control, and Automation

Computational Intelligence: An Introduction, Second Edition offers an in-depth exploration into the adaptive mechanisms that enable intelligent behaviour in complex and changing environments. The main focus of this text is centred on the computational modelling of biological and natural intelligent systems, encompassing swarm intelligence, fuzzy systems, artificial neutral networks, artificial immune systems and evolutionary computation. Engelbrecht provides readers with a wide knowledge of Computational Intelligence (CI) paradigms and algorithms; inviting readers to implement and problem solve real-world, complex problems within the CI development framework. This implementation framework will enable readers to tackle new problems without any difficulty through a single Java class as part of the CI library. Key features of this second edition include: A tutorial, hands-on based presentation of the material. State-of-the-art coverage of the most recent developments in computational intelligence with more elaborate discussions on intelligence and artificial intelligence (AI). New discussion of Darwinian evolution versus Lamarckian evolution, also including swarm robotics, hybrid systems and artificial immune systems. A section on how to perform empirical studies; topics including statistical analysis of stochastic algorithms, and an open source library of CI algorithms. Tables, illustrations, graphs, examples, assignments, Java code implementing the algorithms, and a complete CI implementation and experimental framework. Computational Intelligence: An Introduction, Second Edition is essential reading for third and fourth year undergraduate and postgraduate students studying CI. The first edition has been prescribed by a number of overseas universities and is thus a valuable teaching tool. In addition, it will also be a useful resource for researchers in Computational Intelligence and Artificial Intelligence, as well as engineers, statisticians, operational researchers, and bioinformaticians with an interest in applying AI or CI to solve problems in their domains. Check out http://www.ci.cs.up.ac.za for examples, assignments and Java code implementing the algorithms.

EAI International Conference on Big Data Innovation for Sustainable Cognitive Computing

This book constitutes the refereed proceedings of the Second International Conference on Data Mining and Big Data, DMBD 2017, held in Fukuoka, Japan, in July/August 2017. The 53 papers presented in this volume were carefully reviewed and selected from 96 submissions. They were organized in topical sections named: association analysis; clustering; prediction; classification; schedule and sequence analysis; big data; data analysis; data mining; text mining; deep learning; high performance computing; knowledge base and its framework; and fuzzy control.

Classification and Regression Trees

The methodology used to construct tree structured rules is the focus of this monograph. Unlike many other statistical procedures, which moved from pencil and paper to calculators, this text's use of trees was unthinkable before computers. Both the practical and theoretical sides have been developed in the authors' study of tree methods. Classification and Regression Trees reflects these two sides, covering the use of trees as a data analysis method, and in a more mathematical framework, proving some of their fundamental properties.

Introduction to Genetic Algorithms

Data Mining and Big Data

Offering a wide range of programming examples implemented in MATLAB(R), Computational Intelligence Paradigms: Theory and Applications Using MATLAB(R) 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.

Quantitative Trading

Dengan fuzzy logic, transfer kecerdasan yang dimiliki manusia ke dalam robot, komputer, dan bahkan alat-alat elektronik sehari-hari, telah menjadi mudah, seperti mesin cuci, kamera, microwave, dan lain-lain telah mampu berpikir seperti manusia berkat penerapan fuzzy logic. MATLAB telah menyediakan Fuzzy Logic Toolbox yang berisi kumpulan fungsi-fungsi siap pakai untuk rancang-bangun sistem fuzzy. Bagi mereka yang berlatar-belakang non-komputer, MATLAB menyediakan Graphical User Interface (GUI), suatu alat bantu interaktif yang didesain khusus untuk perancangan sistem fuzzy logic dengan mudah, bahkan untuk seorang pemula. Buku ini akan memandu Anda step-by-step dengan cepat dan mudah dalam memahami konsep fuzzy logic. Pada saat yang sama Anda bisa menguasai MATLAB, terutama Fuzzy Logic Toolbox-nya, karena panduan-panduan yang diberikan dalam buku ini dilakukan dengan langsung berinteraksi dengan MATLAB. Dan melalui buku ini pula, Anda akan mampu dan siap merancang sendiri sistem fuzzy logic untuk aplikasi di bidang Anda.

High Performance Programming for Soft Computing

This book presents the proceedings of the 10th Conference on Theory and Applications of Soft Computing, Computing with Words and Perceptions, ICSCCW 2019, held in Prague, Czech Republic, on August 27–28, 2019. It includes contributions from diverse areas of soft computing and computing with words, such as uncertain computation, decision-making under imperfect information, neuro-fuzzy approaches, deep learning, natural language processing, and others. The topics of the papers include theory and applications of soft computing, information granulation, computing with words, computing with perceptions, image processing with soft computing, probabilistic reasoning, intelligent control, machine learning, fuzzy logic in data analytics and data mining, evolutionary computing, chaotic systems, soft computing in business, economics and finance, fuzzy logic and soft computing in earth sciences, fuzzy logic and soft computing in engineering, fuzzy logic and soft computing in material sciences, soft computing in medicine, biomedical engineering, and pharmaceutical sciences. Showcasing new ideas in the field of theories of soft computing and computing with words and their applications in economics, business, industry, education, medicine, earth sciences, and other fields, it promotes the development and implementation of these paradigms in various real-world contexts. This book is a useful guide for academics, practitioners and graduates.

Hybrid Modeling in Process Industries

Biomimicry uses our scienti?c understanding of biological systems to exploit ideas from nature in order to construct some technology. In this book, we focus onhowtousebiomimicryof the functionaloperationofthe "hardwareandso- ware" of biological systems for the development of optimization algorithms and feedbackcontrolsystemsthatextendourcapabilitiestoimplementsophisticated levels of automation. The primary focus is not on the modeling, emulation, or analysis of some biological system. The focus is on using "bio-inspiration" to inject new ideas, techniques, and perspective into the engineering of complex automation systems.

There are many biological processes that, at some level of abstraction, can berepresentedasoptimizationprocesses,manyofwhichhaveasa basicpurpose automatic control, decision making, or automation. For instance, at the level of everyday experience, we can view the actions of a human operator of some process (e. g. , the driver of a car) as being a series of the best choices he or she makes in trying to achieve some goal (staying on the road); emulation of this decision-making process amounts to modeling a type of biological optimization and decision-making process, and implementation of the resulting algorithm results in "human mimicry" for automation. There are clearer examples of - ological optimization processes that are used for control and automation when you consider nonhuman biological or behavioral processes, or the (internal) - ology of the human and not the resulting external behavioral characteristics (like driving a car). For instance, there are homeostasis processes where, for instance, temperature is regulated in the human body.

Computer Vision and Fuzzy-neural Systems

This book examines the present and future of soft computer techniques. It explains how to use the latest technological tools, such as multicore processors and graphics processing units, to implement highly efficient intelligent system methods using a general purpose computer.

Industrial Applications of Fuzzy Control

This book is devoted to reporting innovative and significant progress in fuzzy system engineering. Given the maturation of fuzzy logic, this book is dedicated to exploring the recent breakthroughs in fuzziness and soft computing in favour of intelligent system engineering. This monograph presents novel developments of the fuzzy theory as well as interesting applications of the fuzzy logic exploiting the theory to engineer intelligent systems.

Computational Intelligence

In this book, we study theoretical and practical aspects of computing methods for mathematical modelling of nonlinear systems. A number of computing techniques are considered, such as methods of operator approximation with any given accuracy; operator interpolation techniques including a non-Lagrange interpolation; methods of system representation subject to constraints associated with concepts of causality, memory and stationarity; methods of system representation with an accuracy that is the best within a given class of models; methods of covariance matrix estimation; methods for low-rank matrix approximations; hybrid methods based on a combination of iterative procedures and best operator approximation; and methods for information compression and filtering under condition that a filter model should satisfy restrictions associated with causality and different types of memory. As a result, the book represents a blend of new methods in general computational analysis, and specific, but also generic, techniques for study of systems theory ant its particular branches, such as optimal filtering and information compression. - Best operator approximation, - Non-Lagrange interpolation, - Generic Karhunen-Loeve transform - Generalised low-rank

matrix approximation - Optimal data compression - Optimal nonlinear filtering

Permanent Magnet Synchronous Machines

This first edition of conference Proceedings reflects the expansion of the field of Mechatronics, which has now taken its place in the world of newer transdisciplinary fields of Adaptronics, Integronics, and Cyber-Mix Mechatronics. It presents state-of-the art advances in Mechatronics, Adaptronics, Integronics and Cyber-Mix-Mechatronics. The 1st International Conference of Mechatronics and Cyber-MixMechatronics/ICOMECYME was organized by the National Institute of R&D in Mechatronics and Measurement Technique in Bucharest (Romania), on September 7th–8th, 2017 and attracted specialists from all over the world—including North America, South America, and Asia. In addition to presenting research results, ICOMECYME also offered a forum for exchange between R&D experts.

ROMANCE ACTION & ADVENTURE MYSTERY & THRILLER BIOGRAPHIES & HISTORY CHILDREN'S YOUNG ADULT FANTASY HISTORICAL FICTION HORROR LITERARY FICTION NON-FICTION SCIENCE FICTION