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Equilibrium Statistical Physics - Michael Plischke 2006-04-25
This third edition of one of the most important and best selling textbooks in statistical physics, is a graduate level text suitable for students in physics, chemistry, and materials science. The discussion of strongly interacting condensed matter systems has been expanded. A chapter on stochastic processes has also been added with emphasis on applications of the Fokker–Planck equation. The modern theory of phase transitions occupies a central place. The chapter devoted to the renormalization group approach is largely rewritten and includes a detailed discussion of the basic concepts and examples of both exact and approximate calculations. The development of the basic tools includes a chapter on computer simulations in which both Monte Carlo method and molecular dynamics are introduced, and a section on Brownian dynamics added. The theories are applied to a number of important systems such as liquids, liquid crystals, polymers, membranes, Bose condensation, superfluidity and superconductivity. There is also an extensive treatment of interacting Fermi and Bose systems, percolation theory and disordered systems in general.

Principles of Quantum Artificial Intelligence - Andreas Wichert 2013-10-23
In this book, we introduce quantum computation and its application to AI. We highlight problem solving and knowledge representation framework. Based on information theory, we cover two main principles of quantum computation — Quantum Fourier transform and Grover search. Then, we indicate how these two principles can be applied to problem solving and finally present a general model of a quantum computer that is based on production systems.
Contents:IntroductionComputationProblem SolvingInformationReversible AlgorithmsProbabilityIntroduction to Quantum PhysicsComputation with QubitsPeriodicitySearchQuantum Problem-SolvingQuantum CognitionRelated Approaches Readership: Professionals, academics, researchers and graduate students in artificial intelligence, theoretical computer science, quantum physics and computational physics.
Keywords:Quantum Computing;Quantum Theory;Artificial Intelligence;Cognitive Computation;AlgorithmsKey Features:Introduces a new subarea of AI — Quantum Artificial IntelligenceOrients itself on

computer science by merging AI and Quantum Computation principles

Neural Network Simulation Environments - Josef Skrzypek 2012-12-06
Neural Network Simulation Environments describes some of the best examples of neural simulation environments. All current neural simulation tools can be classified into four overlapping categories of increasing sophistication in software engineering. The least sophisticated are undocumented and dedicated programs, developed to solve just one specific problem; these tools cannot easily be used by the larger community and have not been included in this volume. The next category is a collection of custom-made programs, some perhaps borrowed from other application domains, and organized into libraries, sometimes with a rudimentary user interface. More recently, very sophisticated programs started to appear that integrate advanced graphical user interface and other data analysis tools. These are frequently dedicated to just one neural architecture/algorithm as, for example, three layers of interconnected artificial `neurons' learning to generalize input vectors using a backpropagation algorithm. Currently, the most sophisticated simulation tools are complete, system-level environments, incorporating the most advanced concepts in software engineering that can support experimentation and model development of a wide range of neural networks. These environments include sophisticated graphical user interfaces as well as an array of tools for analysis, manipulation and visualization of neural data. Neural Network Simulation Environments is an excellent reference for researchers in both academia and industry, and can be used as a text for advanced courses on the subject.

Multi-Objective Optimization in Theory and Practice II: Metaheuristic Algorithms - André A. Keller 2019-03-28
Multi-Objective Optimization in Theory and Practice is a simplified two-part approach to multi-objective optimization (MOO) problems. This second part focuses on the use of metaheuristic algorithms in more challenging practical cases. The book includes ten chapters that cover several advanced MOO techniques. These include the determination of Pareto-optimal sets of solutions, metaheuristic algorithms, genetic search algorithms and evolution strategies, decomposition algorithms, hybridization of different metaheuristics, and many-objective (more than three objectives) optimization and parallel computation. The final section of the book presents information about the design and types of fifty test problems for which the Pareto-optimal front is approximated. For each of them, the package NSGA-II is used to approximate the Pareto-optimal front. It is an essential handbook for students and teachers involved in advanced optimization courses in engineering, information science and mathematics degree programs.

Modern Water Resources Engineering - Lawrence K. Wang 2014-01-11
The Handbook of Environmental Engineering series is an incredible collection of methodologies that study the effects of pollution and waste in their three basic forms: gas, solid, and liquid. This exciting new addition to the series, Volume 15: Modern Water Resources Engineering , has been designed to serve as a water resources engineering reference book as well as a supplemental textbook. We hope and expect it will prove of equal high value to advanced undergraduate and graduate students, to designers of water resources systems, and to scientists and researchers. A critical volume in the Handbook of Environmental Engineering series, chapters employ methods of practical design and calculation illustrated by numerical examples, include pertinent cost data whenever possible, and explore in great detail the fundamental principles of the field. Volume 15: Modern Water Resources Engineering, provides information on some of the most innovative and ground-breaking advances in the field today from a panel of esteemed experts.

Artificial Neural Networks - Kenji Suzuki 2011-04-11
Artificial neural networks may probably be the single most successful technology in the last two decades which has been widely used in a large variety of applications in various areas. The purpose of this book is to provide recent advances of artificial neural networks in biomedical applications. The book begins with fundamentals of artificial neural networks, which cover an introduction, design, and optimization. Advanced architectures for biomedical applications, which offer improved performance and desirable properties, follow. Parts continue

with biological applications such as gene, plant biology, and stem cell, medical applications such as skin diseases, sclerosis, anesthesia, and physiotherapy, and clinical and other applications such as clinical outcome, telecare, and pre-med student failure prediction. Thus, this book will be a fundamental source of recent advances and applications of artificial neural networks in biomedical areas. The target audience includes professors and students in engineering and medical schools, researchers and engineers in biomedical industries, medical doctors, and healthcare professionals.

Artificial Intelligence and Symbolic Computation - John A. Campbell 2003-06-29
This book constitutes the thoroughly refereed post-proceedings of the International Conference on Artificial Intelligence and Symbolic Computation, AISC 2000, held in Madrid, Spain in July 2000. The 17 revised full papers presented together with three invited papers were carefully reviewed and revised for inclusion in the book. Among the topics addressed are automated theorem proving, logical reasoning, mathematical modeling of multi-agent systems, expert systems and machine learning, computational mathematics, engineering, and industrial applications.

Computational Intelligence Techniques for Trading and Investment - Christian Dunis 2014-03-26
Computational intelligence, a sub-branch of artificial intelligence, is a field which draws on the natural world and adaptive mechanisms in order to study behaviour in changing complex environments. This book provides an interdisciplinary view of current technological advances and challenges concerning the application of computational intelligence techniques to financial time-series forecasting, trading and investment. The book is divided into five parts. The first part introduces the most important computational intelligence and financial trading concepts, while also presenting the most important methodologies from these different domains. The second part is devoted to the application of traditional computational intelligence techniques to the fields of financial forecasting and trading, and the third part explores the applications of artificial neural networks in these domains. The fourth part delves into novel evolutionary-based hybrid methodologies for trading and portfolio management, while the fifth part presents the applications of advanced computational intelligence modelling techniques in financial forecasting and trading. This volume will be useful for graduate and postgraduate students of finance, computational finance, financial engineering and computer science. Practitioners, traders and financial analysts will also benefit from this book.

Neural Information Processing and VLSI - Bing J. Sheu 2012-12-06
Neural Information Processing and VLSI provides a unified treatment of this important subject for use in classrooms, industry, and research laboratories, in order to develop advanced artificial and biologically-inspired neural networks using compact analog and digital VLSI parallel processing techniques. Neural Information Processing and VLSI systematically presents various neural network paradigms, computing architectures, and the associated electronic/optical implementations using efficient VLSI design methodologies. Conventional digital machines cannot perform computationally-intensive tasks with satisfactory performance in such areas as intelligent perception, including visual and auditory signal processing, recognition, understanding, and logical reasoning (where the human being and even a small living animal can do a superb job). Recent research advances in artificial and biological neural networks have established an important foundation for high-performance information processing with more efficient use of computing resources. The secret lies in the design optimization at various levels of computing and communication of intelligent machines. Each neural network system consists of massively paralleled and distributed signal processors with every processor performing very simple operations, thus consuming little power. Large computational capabilities of these systems in the range of some hundred giga to several tera operations per second are derived from collectively parallel processing and efficient data routing, through well-structured interconnection networks. Deep-submicron very large-scale integration (VLSI) technologies can integrate tens of millions of transistors in a

single silicon chip for complex signal processing and information manipulation. The book is suitable for those interested in efficient neurocomputing as well as those curious about neural network system applications. It has been especially prepared for use as a text for advanced undergraduate and first year graduate students, and is an excellent reference book for researchers and scientists working in the fields covered.

Issues in Applying SLA Theories toward Reflective and Effective Teaching - 2018-08-30

"A reflective teacher as a growth-minded person seeks opportunities to continue professional development. Reflection not only ignites a teacher's desire for improvement, but also inspires continuous learning. Through accurate grasp of self-assessment, confidence, self-appraisal, a reflective practitioner can plant the seeds of effective teaching. This book aims to guide EFL teachers to teach language reflectively and effectively. It includes two parts, the first focuses on the SLA theories and their impact on language teaching and the second centers on the reflective and effective teaching of language components and skills. The editors hope this book could contribute to those who wish to become effective teachers since this results in nurturing learners' cravings to learn in a safe and supportive environment"--

MICAI 2009: Advances in Artificial Intelligence - Arturo Hernández Aguirre 2009-10-26

This book constitutes the refereed proceedings of the 8th Mexican International Conference on Artificial Intelligence, MICAI 2009, held in Guanajuato, Mexico, in November 2009. The 63 revised full papers presented together with one invited talk were carefully reviewed and selected from 215 submissions. The papers are organized in topical sections on logic and reasoning, ontologies, knowledge management and knowledge-based systems, uncertainty and probabilistic reasoning, natural language processing, data mining, machine learning, pattern recognition, computer vision and image processing, robotics, planning and scheduling, fuzzy logic, neural networks, intelligent tutoring systems, bioinformatics and medical applications, hybrid intelligent systems and evolutionary algorithms.

Neural Networks for Applied Sciences and Engineering - Sandhya Samarasinghe 2016-04-19

In response to the exponentially increasing need to analyze vast amounts of data, Neural Networks for Applied Sciences and Engineering: From Fundamentals to Complex Pattern Recognition provides scientists with a simple but systematic introduction to neural networks. Beginning with an introductory discussion on the role of neural networks in

A Study of Business Decisions Under Uncertainty - Andreas Stark 2010-07

This dissertation will discuss the uncertainty encountered in the daily operations of businesses. The concepts will be developed by first giving an overview of probability and statistics as used in our everyday activities, such as the basic principles of probability, univariate and multivariate statistics, data clustering and mapping, as well as time sequence and spectral analysis. The examples used will be from the oil and gas exploration industry because the risks taken in this industry are normally quite large and are ideal for showing the application of the various techniques for minimizing risk. Subsequently, the discussion will deal with basic risk analysis, spatial and time variations of risk, geotechnical risk analysis, risk aversion and how it is affected by personal biases, and how to use portfolios to hedge risk together with the application of real options. Next, fractal analysis and its application to economics and risk analysis will be examined, followed by some examples showing the change in the Value at Risk under Fractal Brownian Motions. Finally, a neural network application is shown whereby some of these risks and risk factors will be combined to forecast the best possible outcome given a certain knowledge base. The chapters will discuss: Basic probability techniques and uncertainty principles Analysis and diversification for exploration projects The value and risk of information in the decision process Simulation techniques and modeling of uncertainty Project valuation and project risk return Modeling risk propensity or preference analysis of exploration projects Application of fractals to risk analysis Simultaneous prediction of strategic risk and

decision attributes using multivariate statistics and neural networks"

Neural Networks in QSAR and Drug Design - James Devillers
1996-08-09
Comprehensive and impeccably edited, Neural Networks in QSAR and Drug Design is the first book to present an all-inclusive coverage of the topic. The book provides a practice-oriented introduction to the different neural network paradigms, allowing the reader to easily understand and reproduce the results demonstrated. Numerous examples are detailed, demonstrating a variety of applications to QSAR and drug design. The contributors include some of the most distinguished names in the field, and the book provides an exhaustive bibliography, guiding readers to all the literature related to a particular type of application or neural network paradigm. The extensive index acts as a guide to the book, and makes retrieving information from chapters an easy task. A further research aid is a list of software with indications of availablility and price, as well as the editors scale rating the ease of use and interest/price ratio of each software package. The presentation of new, powerful tools for modeling molecular properties and the inclusion of many important neural network paradigms, coupled with extensive reference aids, makes Neural Networks in QSAR and Drug Design an essential reference source for those on the frontiers of this field. Presents the first coverage of neural networks in QSAR and Drug Design Allows easy understanding and reproduction of the results described within Includes an exhaustive bibliography with more than 200 references Provides a list of applicable software packages with availability and price

From Curve Fitting to Machine Learning - Achim Zielesny
2011-07-28
The analysis of experimental data is at heart of science from its beginnings. But it was the advent of digital computers that allowed the execution of highly non-linear and increasingly complex data analysis procedures - methods that were completely unfeasible before. Non-linear curve fitting, clustering and machine learning belong to these modern techniques which are a further step towards computational intelligence.

The goal of this book is to provide an interactive and illustrative guide to these topics. It concentrates on the road from two dimensional curve fitting to multidimensional clustering and machine learning with neural networks or support vector machines. Along the way topics like mathematical optimization or evolutionary algorithms are touched. All concepts and ideas are outlined in a clear cut manner with graphically depicted plausibility arguments and a little elementary mathematics. The major topics are extensively outlined with exploratory examples and applications. The primary goal is to be as illustrative as possible without hiding problems and pitfalls but to address them. The character of an illustrative cookbook is complemented with specific sections that address more fundamental questions like the relation between machine learning and human intelligence. These sections may be skipped without affecting the main road but they will open up possibly interesting insights beyond the mere data massage. All topics are completely demonstrated with the aid of the commercial computing platform Mathematica and the Computational Intelligence Packages (CIP), a high-level function library developed with Mathematica's programming language on top of Mathematica's algorithms. CIP is open-source so the detailed code of every method is freely accessible. All examples and applications shown throughout the book may be used and customized by the reader without any restrictions. The target readerships are students of (computer) science and engineering as well as scientific practitioners in industry and academia who deserve an illustrative introduction to these topics. Readers with programming skills may easily port and customize the provided code.

Soft Computing for Recognition based on Biometrics - Patricia Melin
2010-09-30
We describe in this book, bio-inspired models and applications of hybrid intel- gent systems using soft computing techniques for image analysis and pattern r- ognition based on biometrics and other information sources. Soft Computing (SC) consists of several intelligent computing paradigms, including fuzzy logic, neural networks, and bio-inspired optimization algorithms, which can be used to produce powerful hybrid

intelligent systems. The book is organized in five main parts, which contain a group of papers around a similar subject. The first part consists of papers with the main theme of classification methods and applications, which are basically papers that propose new models for classification to solve general pr- lems and applications. The second part contains papers with the main theme of modular neural networks in pattern recognition, which are basically papers using bio-inspired techniques, like modular neural networks, for achieving pattern r- ognition based on biometric measures. The third part contains papers with the theme of bio-inspired optimization methods and applications to diverse problems. The fourth part contains papers that deal with general theory and algorithms of bio-inspired methods, like neural networks and evolutionary algorithms. The fifth part contains papers on computer vision applications of soft computing methods. In the part of classification methods and applications there are 5 papers that - scribe different contributions on fuzzy logic and bio-inspired models with appli- tion in classification for medical images and other data.

Functional Networks with Applications - Enrique Castillo 2012-12-06 Artificial neural networks have been recognized as a powerful tool to learn and reproduce systems in various fields of applications. Neural networks are inspired by the brain behavior and consist of one or several layers of neurons, or computing units, connected by links. Each artificial neuron receives an input value from the input layer or the neurons in the previ ous layer. Then it computes a scalar output from a linear combination of the received inputs using a given scalar function (the activation function), which is assumed the same for all neurons. One of the main properties of neural networks is their ability to learn from data. There are two types of learning: structural and parametric. Structural learning consists of learning the topology of the network, that is, the number of layers, the number of neurons in each layer, and what neurons are connected. This process is done by trial and error until a good fit to the data is obtained. Parametric learning consists of learning the weight values for a given topology of the network. Since the neural functions are given, this learning process is achieved by estimating the connection

weights based on the given information. To this aim, an error function is minimized using several well known learning methods, such as the backpropagation algorithm. Unfortunately, for these methods: (a) The function resulting from the learning process has no physical or engineering interpretation. Thus, neural networks are seen as black boxes.

Handbook of Research on Nature-Inspired Computing for Economics and Management - Rennard, Jean-Philippe 2006-09-30 "This book provides applications of nature inspired computing for economic theory and practice, finance and stock-market, manufacturing systems, marketing, e-commerce, e-auctions, multi-agent systems and bottom-up simulations for social sciences and operations management"-- Provided by publisher.
Social Psychology and Cultural Context - John Adamopoulos 1999-07-28 Social Psychology and Cultural Context is the first survey of social psychology to integrate cross-cultural issues. The book not only utilizes several variants of the construct of subjective culture but also reflects the current state of affairs in the social domain of cross-cultural psychology. Written by world-renowned specialists, the chapters in this volume offer valuable insights to students and researchers in both cross-cultural and social psychology.
Hybrid Imaging and Visualization - Joseph Awange 2019-11-27 The book introduces the latest methods and algorithms developed in machine and deep learning (hybrid symbolic-numeric computations, robust statistical techniques for clustering and eliminating data as well as convolutional neural networks) dealing not only with images and the use of computers, but also their applications to visualization tasks generalized by up-to-date points of view. Associated algorithms are deposited on iCloud.
Mathematical Geosciences - Joseph L. Awange 2018-01-29 This book showcases powerful new hybrid methods that combine numerical and symbolic algorithms. Hybrid algorithm research is currently one of the most promising directions in the context of geosciences mathematics and computer mathematics in general. One

important topic addressed here with a broad range of applications is the solution of multivariate polynomial systems by means of resultants and Groebner bases. But that's barely the beginning, as the authors proceed to discuss genetic algorithms, integer programming, symbolic regression, parallel computing, and many other topics. The book is strictly goal-oriented, focusing on the solution of fundamental problems in the geosciences, such as positioning and point cloud problems. As such, at no point does it discuss purely theoretical mathematics. "The book delivers hybrid symbolic-numeric solutions, which are a large and growing area at the boundary of mathematics and computer science." Dr. Daniel Li chtbau

Pulsed Neural Networks - Wolfgang Maass 2001-01-26
Most practical applications of artificial neural networks are based on a computational model involving the propagation of continuous variables from one processing unit to the next. In recent years, data from neurobiological experiments have made it increasingly clear that biological neural networks, which communicate through pulses, use the timing of the pulses to transmit information and perform computation. This realization has stimulated significant research on pulsed neural networks, including theoretical analyses and model development, neurobiological modeling, and hardware implementation. This book presents the complete spectrum of current research in pulsed neural networks and includes the most important work from many of the key scientists in the field. Terrence J. Sejnowski's foreword, "Neural Pulse Coding," presents an overview of the topic. The first half of the book consists of longer tutorial articles spanning neurobiology, theory, algorithms, and hardware. The second half contains a larger number of shorter research chapters that present more advanced concepts. The contributors use consistent notation and terminology throughout the book. Contributors Peter S. Burge, Stephen R. Deiss, Rodney J. Douglas, John G. Elias, Wulfram Gerstner, Alister Hamilton, David Horn, Axel Jahnke, Richard Kempter, Wolfgang Maass, Alessandro Mortara, Alan F. Murray, David P. M. Northmore, Irit Opher, Kostas A. Papathanasiou, Michael Recce, Barry J. P. Rising, Ulrich Roth, Tim Schönauer, Terrence J. Sejnowski, John Shawe-Taylor, Max R. van Daalen, J. Leo van Hemmen, Philippe Venier, Hermann Wagner, Adrian M. Whatley, Anthony M. Zador

Advanced Manufacturing Systems and Technology - E. Kuljanic 2014-05-04
This book, based on the Fourth International Conference on Advanced Manufacturing Systems and Technology - AMST '96 aims at presenting trend and up-to-date information on the latest developments - research results and industrial experience in the field of machining processes, optimization and process planning, forming, flexible machining systems, non conventional machining, robotics and control, measuring and quality, thus providing an international forum for a beneficial exchange of ideas, and furthering a favourable cooperation between research and industry.

Advances in Computing Applications - Amlan Chakrabarti 2017-01-19
This edited volume presents the latest high-quality technical contributions and research results in the areas of computing, informatics, and information management. The book deals with state-of art topics, discussing challenges and possible solutions, and explores future research directions. The main goal of this volume is not only to summarize new research findings but also place these in the context of past work. This volume is designed for professional audience, composed of researchers, practitioners, scientists and engineers in both the academia and the industry.

The Mathematica Journal - 1993

Simulating Neural Networks with Mathematica - James A. Freeman 1994
An introduction to neural networks, their operation and their application, in the context of Mathematica, a mathematical programming language. Feature show how to simulate neural network operations using Mathematica and illustrates the techniques for employing Mathematics to assess neural network behaviour and performance.
Equilibrium Statistical Physics - Michael Plischke 1994

This textbook concentrates on modern topics in statistical physics with an emphasis on strongly interacting condensed matter systems. The book is self-contained and is suitable for beginning graduate students in physics and materials science or undergraduates who have taken an introductory course in statistical mechanics. Phase transitions and critical phenomena are discussed in detail including mean field and Landau theories and the renormalization group approach. The theories are applied to a number of interesting systems such as magnets, liquid crystals, polymers, membranes, interacting Bose and Fermi fluids; disordered systems, percolation and spin of equilibrium concepts are also discussed. Computer simulations of condensed matter systems by Monte Carlo-based and molecular dynamics methods are treated.

Artificial Neural Network Modelling - Subana Shanmuganathan 2016-02-03
This book covers theoretical aspects as well as recent innovative applications of Artificial Neural networks (ANNs) in natural, environmental, biological, social, industrial and automated systems. It presents recent results of ANNs in modelling small, large and complex systems under three categories, namely, 1) Networks, Structure Optimisation, Robustness and Stochasticity 2) Advances in Modelling Biological and Environmental Systems and 3) Advances in Modelling Social and Economic Systems. The book aims at serving undergraduates, postgraduates and researchers in ANN computational modelling.

Systems - Gabriel Altmann 1998-01-01

Numerical Solutions for Partial Differential Equations - Victor Grigor'e Ganzha 2017-11-22
Partial differential equations (PDEs) play an important role in the natural sciences and technology, because they describe the way systems (natural and other) behave. The inherent suitability of PDEs to characterizing the nature, motion, and evolution of systems, has led to their wide-ranging use in numerical models that are developed in order to analyze systems that are not otherwise easily studied. Numerical Solutions for Partial Differential Equations contains all the details necessary for the reader to understand the principles and applications of advanced numerical methods for solving PDEs. In addition, it shows how the modern computer system algebra Mathematica® can be used for the analytic investigation of such numerical properties as stability, approximation, and dispersion.

Algorithmic Trading Methods - Robert L. Kissell 2020-09-08
Algorithmic Trading Methods: Applications using Advanced Statistics, Optimization, and Machine Learning Techniques, Second Edition, is a sequel to The Science of Algorithmic Trading and Portfolio Management. This edition includes new chapters on algorithmic trading, advanced trading analytics, regression analysis, optimization, and advanced statistical methods. Increasing its focus on trading strategies and models, this edition includes new insights into the ever-changing financial environment, pre-trade and post-trade analysis, liquidation cost & risk analysis, and compliance and regulatory reporting requirements. Highlighting new investment techniques, this book includes material to assist in the best execution process, model validation, quality and assurance testing, limit order modeling, and smart order routing analysis. Includes advanced modeling techniques using machine learning, predictive analytics, and neural networks. The text provides readers with a suite of transaction cost analysis functions packaged as a TCA library. These programming tools are accessible via numerous software applications and programming languages. Provides insight into all necessary components of algorithmic trading including: transaction cost analysis, market impact estimation, risk modeling and optimization, and advanced examination of trading algorithms and corresponding data requirements. Increased coverage of essential mathematics, probability and statistics, machine learning, predictive analytics, and neural networks, and applications to trading and finance. Advanced multiperiod trade schedule optimization and portfolio construction techniques. Techniques to decode broker-dealer and third-party vendor models. Methods to incorporate TCA into proprietary alpha models and portfolio optimizers. TCA library for numerous software applications and programming languages including: MATLAB, Excel Add-In, Python, Java,

C/C++, .Net, Hadoop, and as standalone .EXE and .COM applications.
Neural Networks - Berndt Müller 2012-12-06
Neural Networks presents concepts of neural-network models and techniques of parallel distributed processing in a three-step approach: - A brief overview of the neural structure of the brain and the history of neural-network modeling introduces to associative memory, preceptrons, feature-sensitive networks, learning strategies, and practical applications. - The second part covers subjects like statistical physics of spin glasses, the mean-field theory of the Hopfield model, and the "space of interactions" approach to the storage capacity of neural networks. - The final part discusses nine programs with practical demonstrations of neural-network models. The software and source code in C are on a 3 1/2" MS-DOS diskette can be run with Microsoft, Borland, Turbo-C, or compatible compilers.

Building Neural Networks - David M. Skapura 1996
This practical introduction describes the kinds of real-world problems neural network technology can solve. Surveying a range of neural network applications, the book demonstrates the construction and operation of artificial neural systems. Through numerous examples, the author explains the process of building neural-network applications that utilize recent connectionist developments, and conveys an understanding both of the potential, and the limitations of different network models. Examples are described in enough detail for you to assimilate the information and then use the accumulated experience of others to create your own applications. These examples are deliberately restricted to those that can be easily understood, and recreated, by any reader, even the novice practitioner. In some cases the author describes alternative approaches to the same application, to allow you to compare and contrast their advantages and disadvantages. Organized by application areas, rather than by specific network architectures or learning algorithms, Buiilding Neural Networks shows why certain networks are more suitable than others for solving specific kinds of problems. Skapura also reviews principles of neural information processing and furnishes an operations summary of the most popular neural-network processing

models. Finally, the book provides information on the practical aspects of application design, and contains six topic-oriented chapters on specific applications of neural-network systems. These applications include networks that perform: Pattern matching, storage, and recall Business and financial systems Data extraction from images Mechanical process control systems New neural networks that combine pattern matching with fuzzy logic The book includes application-oriented excercises that further help you see how a neural network solves a problem, and that reinforce your understanding of modeling techniques.
0201539217B04062001
Optimizing Decision Making in the Apparel Supply Chain Using Artificial Intelligence (AI) - Calvin Wong 2013-01-24
Practitioners in apparel manufacturing and retailing enterprises in the fashion industry, ranging from senior to front line management, constantly face complex and critical decisions. There has been growing interest in the use of artificial intelligence (AI) techniques to enhance this process, and a number of AI techniques have already been successfully applied to apparel production and retailing. Optimizing decision making in the apparel supply chain using artificial intelligence (AI): From production to retail provides detailed coverage of these techniques, outlining how they are used to assist decision makers in tackling key supply chain problems. Key decision points in the apparel supply chain and the fundamentals of artificial intelligence techniques are the focus of the opening chapters, before the book proceeds to discuss the use of neural networks, genetic algorithms, fuzzy set theory and extreme learning machines for intelligent sales forecasting and intelligent product cross-selling systems. Helps the reader gain an understanding of the key decision points in the apparel supply chain Discusses the fundamentals of artificial intelligence techniques for apparel management techniques Considers the use of neural networks in selecting the location of apparel manufacturing plants
Speech Coding Algorithms - Wai C. Chu 2004-03-04
Speech coding is a highly mature branch of signal processing deployed in products such as cellular phones, communication devices, and more

recently, voice over internet protocol This book collects many of the techniques used in speech coding and presents them in an accessible fashion Emphasizes the foundation and evolution of standardized speech coders, covering standards from 1984 to the present The theory behind the applications is thoroughly analyzed and proved

Connectionism - Michael R. W. Dawson 2008-04-15
Connectionism is a "hands on" introduction toconnectionist modeling through practical exercises in differenttypes of connectionist architectures. explores three different types of connectionist architectures– distributed associative memory, perceptron, and multilayerperceptron provides a brief overview of each architecture, a detailedintroduction on how to use a program to explore this network, and aseries of practical exercises that are designed to highlight theadvantages, and disadvantages, of each accompanied by a website athttp://www.bcp.psych.ualberta.ca/~mike/Book3/ that includespractice exercises and software, as well as the files and blankexercise sheets required for performing the exercises designed to be used as a stand-alone volume or alongsideMinds and Machines: Connectionism and Psychological Modeling(by Michael R.W. Dawson, Blackwell 2004)

Explaining neural networks in raw Python - Wojciech Broniowski 2021-07-15
These lectures explain the very basic concepts of neural networks at a most elementary level, requiring only very rudimentary knowledge of Python, or actually any programming language. With simplicity in mind, the code for various algorithms of neural networks is written from absolute scratch, i.e. without any use of dedicated higher-level libraries. That way one can follow all the programming steps in an explicit manner. The book is intended for undergraduate students and for advanced high school pupils and their teachers.

Encyclopedia of Ecology - Brian D. Fath 2018-08-23
Encyclopedia of Ecology, Second Edition continues the acclaimed work of the previous edition published in 2008. It covers all scales of biological organization, from organisms, to populations, to communities and ecosystems. Laboratory, field, simulation modelling, and theoretical approaches are presented to show how living systems sustain structure and function in space and time. New areas of focus include micro- and macro scales, molecular and genetic ecology, and global ecology (e.g., climate change, earth transformations, ecosystem services, and the food-water-energy nexus) are included. In addition, new, international experts in ecology contribute on a variety of topics. Offers the most broad-ranging and comprehensive resource available in the field of ecology Provides foundational content and suggests further reading Incorporates the expertise of over 500 outstanding investigators in the field of ecology, including top young scientists with both research and teaching experience Includes multimedia resources, such as an Interactive Map Viewer and links to a CSDMS (Community Surface Dynamics Modeling System), an open-source platform for modelers to share and link models dealing with earth system processes

Mathematica as a Tool - Stephan Kaufmann 2012-12-06
Mathematica combines symbolic and numerical calculations, plots, graphics programming, list calculations and structured documentation into an interactive environment. This book covers the program and shows with practical examples how even more complex problems can be solved with just a few commands. From the reviews: "A valuable introductory textbook on Mathematica and is very useful to scientists and engineers who use Mathematica in their work." -- ZENTRALBLATT MATH

Computational Science — ICCS 2002 - Peter M.A. Sloot 2003-08-01
Computational Science is the scienti?c discipline that aims at the development and understanding of new computational methods and techniques to model and simulate complex systems. The area of application includes natural systems – such as biology, envir- mental and geo-sciences, physics, and chemistry – and synthetic systems such as electronics and ?nancial and economic systems. The discipline is a bridge b- ween 'classical' computer science – logic, complexity, architecture, algorithms – mathematics, and the use of computers in the aforementioned areas. The relevance for society stems from the numerous challenges that exist in the various science and engineering

disciplines, which can be tackled by advances made in this ?eld. For instance new models and methods to study environmental issues like the quality of air, water, and soil, and weather and climate predictions through simulations, as well as the simulation-supported development of cars, airplanes, and medical and transport systems etc. Paraphrasing R. Kenway (R.D. Kenway, Contemporary Physics. 1994): 'There is an important message to scientists, politicians, and industrialists: in the future science, the best industrial design and manufacture, the greatest medical progress, and the most accurate environmental monitoring and forecasting will be done by countries that most rapidly exploit the full potential ofcomputational science'. Nowadays we have access to high-end computer architectures and a large range of computing environments, mainly as a consequence of the enormous s- mulus from the various international programs on advanced computing, e.g.