Adaptive Pattern Recognition And Neural Networks

A coherent introduction to the basic concepts of pattern recognition, incorporating recent advances from AI, neurobiology, engineering, and other disciplines. Treats specifically the implementation of adaptive pattern recognition to neural networks. Annotation copyright Book News, Inc. Portland, Or.

This book constitutes the refereed proceedings of the Second IAPR Workshop on Artificial Neural Networks in Pattern Recognition, ANNPR 2006, held in Ulm, Germany in August/September 2006. The 26 revised papers presented were carefully reviewed and selected from 49 submissions. The papers are organized in topical sections on unsupervised learning, semi-supervised learning, supervised learning, support vector learning, multiple classifier systems, visual object recognition, and data mining in bioinformatics.

Artificial neural networks are nonlinear mapping systems whose structure is loosely based on principles observed in the nervous systems of humans and animals. The basic idea is that massive systems of simple units linked together in appropriate ways can generate many complex and interesting behaviors. This book focuses on the subset of feedforward artificial neural networks called multilayer perceptrons (MLP). These are the mostly widely used neural networks, with applications as diverse as finance (forecasting), manufacturing (process control), and science (speech and image recognition). This book presents an extensive and practical overview of almost every aspect of MLP methodology, progressing from an initial discussion of what MLPs are and how they might be used to an in-depth examination of technical factors affecting performance. The book can be used as a tool kit by readers interested in applying methods to specific problems, yet it also presents theory and references outlining the last ten years of MLP research.

This 1996 book explains the statistical framework for pattern recognition and machine learning, now in paperback.

8th IAPR TC3 Workshop, ANNPR 2018, Siena, Italy, September 19-21, 2018, Proceedings

Adaptive Analog VLSI Neural Systems

Adaptive and Learning Systems

Pattern Recognition

Recent Advances and Challenges

Biologically inspired computing is different from conventional computing. It has a different feel; often the terminology does not sound like it's talking about machines. The activities of this computing sound more human than mechanistic as people speak of machines that behave, react, self-organize, learn, generalize, remember and even to forget. Much of this technology tries to mimic nature's approach in order to mimic some of nature's capabilities. They have a rigorous, mathematical basis and neural networks for example have a statistically valid set on which the network is trained. Two outlines are suggested as the possible tracks for pattern recognition. They are neural networks and functional networks. Neural Networks (many interc- nected elements operating in parallel) carry out tasks that are not only beyond the scope of conventional processing but also cannot be understood in the same terms. Imaging application for neural networks seem to be a natural?t. Neural networks love to do pattern recognition. A new approach to pattern recognition using microARTMAP together with wavelet transforms in the context of hand written characters, gestures and signatures have been dealt. The Kohonen N- work, Back Propagation Networks and Competitive Hop?eld Neural Network have been considered for various applications. Functional networks, being a generalized form of Neural Networks where fu- tions are learned rather than weights is compared with Multiple Regression An- ysis for some applications and the results are seen to be coincident. New kinds of intelligence can be added to machines, and we will have the possibility of learning more about learning. Thus our imaginations and options are being stretched. These new machines will be fault-tolerant, self-programming thus trying to make them achieve less smarter. So as to make those who use the techniques even smarter. Chapter 1 is a brief introduction to Neural and Functional networks in the context of Pattern recognition using these disciplines. Chapter 2 gives a review of the architectures relevant to the investigation and the development of these technologies in the past few decades. Retracted VIII Preface Chapter 3 begins with the look at the recognition of handwritten alphabets using the algorithm for ordered list of boundary pixels as well as the Ko- nen Self-Organizing Map (SOM). Chapter 4 describes the architecture of the MicroARTMAP and its capability.

The addition of artificial neural network computing to traditional pattern recognition has given rise to a new, different, and more powerful methodology that is presented in this interesting book. This is a practical guide to the application of artificial neural networks. Geared toward the practitioner, Pattern Recognition with Neural Networks in C++ covers pattern classification and neural network approaches within the same framework. Through the book's presentation of underlying theory and numerous practical examples, readers gain an understanding that will allow them to make judicious design choices rendering neural application predictable and effective. The book provides an intuitive explanation of each method for each network paradigm. This discussion is supported by a rigorous mathematical approach where necessary. C++ has emerged as a rich and descriptive means by which concepts, models, or algorithms can be precisely described. For many of the neural network models discussed, C++ programs are presented for the actual implementation. Pictorial diagrams and in-depth discussions explain each topic. Necessary derivative steps for the mathematical models are included so that readers can incorporate new ideas into their programs as the field advances with new developments. For each approach, the authors clearly state the known theoretical results, the known tendencies of the approach, and their recommendations for getting the best results from the method. The material covered in the book is accessible to working engineers with little or no explicit background in neural networks. However, the material is presented in sufficient depth so that those with prior knowledge will find this book beneficial. Pattern Recognition with Neural Networks in C++ is also suitable for courses in neural networks at an advanced undergraduate or graduate level. This book is valuable for academic as well as practical research.

RAM-based networks are a class of methods for building pattern recognition systems. Unlike other neural network methods, they train very rapidly and can be implemented in simple hardware. This important book presents an overview of the subject and the latest work by a number of researchers in the field of RAM-based networks. Contents: RAM-Based Methods:RAM-Based Neural Networks, a Short History (J Austin)From WISARD to MAGNUS: A Family of Weightless Virtual Neural Machines (I Aleksander)A Comparative Study of GSN? Learning Methods (A C P L F De Carvalho et al.)The Advanced Uncertain Reasoning Architecture, AURA (J Austin et al.)Extensions to N-Tuple Theory:Benchmarking N-Tuple Classifier with StatLog Datasets (M Morciniec & R Rohwer)Comparison of Some Methods for Processing " Grey Level" Data in Weightless Networks (R J Mitchell et al.)A Framework for Reasoning About RAM-Based Neural Networks for Image Analysis Applications (G Howells et al.)Cross-Validation and Information Measures for RAM-Based Neural Networks (T M Jørgensen et al.)A Modular Approach to Storage Capacity (P J L Adeodato & J G Taylor)Good-Turning Estimation for the Frequentist N-Tuple Classifier (M Morciniec & R Rohwer)Partially Pre-Calculated Weights for Backpropagation Training of RAM Nets Using Inhibition Between Classes (T M Jørgensen)A New Paradigm for RAM-Based Neural Networks (G Howells et al.)Applications of RAM-Based Networks:Content Analysis of Document Images Using the ADAM Associative Memory (S E M O'Keefe & J Austin)Texture Image Classification Using N-Tuple Coding of the Zero-Crossing Sketch (L Hepplewhite & T J Stonham)A Compound Eye for a Simple Robotic Insect (J M Bishop et al.)Extracting Directional Information for the Recognition of Fingerprints by pRAM Networks (T G Clarkson & Y Ding)Detection of Spatial and Temporal Relations in a Two-Dimensional Scene Using a Phased Weightless Neural State Machine (P Ntourntoufis & T J Stonham)Combining Two Boolean Neural Networks for Image Classification (A C P L F De Carvalho et al.)Detecting Danger Labels with RAM-Based Neural Networks (C Linneberg et al.)Fast Simulation of a Binary Neural Network on a Message Passing Parallel Computer (T Macek et al.)C-NNAP: A Dedicated Processor for Binary Neural Networks (J V Kennedy et al.) Readership: Research scientists and applied computer scientists. keywords:Neural Networks;Pattern Recognition;Connectionism;Statistics;Image Analysis;Artificial Intelligence;Soft Computing;Computers;Pattern Analysis;Parallel Processing

The neural network paradigm with its various advantages might be the next promising bridge between artificial intelligence and pattern recognition that will help with the conceptualization of new computational artifacts. This volume contains ten papers which represent some of the work being done in the field, such as in computational neuroscience, pattern recognition, computational vision, and applications. Contents:Introduction (J Skrzypek & W Karplus)Lightness Constancy from Luminance Contrast (J Skrzypek & D Gungner)Bringing the Grandmother Back into the Picture: A Memory-Based View of Object Recognition (S Edelman & T Poggio)Internal Organization of Classifier Networks Trained by Backpropagation (D F Michaels)System Identification with Artificial Neural Networks (E R Tisdale & W J Karplus)Mixed Finite Element Based Neural Networks in Visual Reconstruction (D Suter)The Random Neural Network Model for Texture Generation (V Atalay et al.)Neural Networks for Collective Translational Invariant Object Recognition (L-W Chan)Image Recognition and Reconstruction Using Associative Magnetic Processing (J M Goodwin et al.)Incorporating Uncertainty in Neural Networks (B R Kämmerer)Neural Networks for the Recognition of Engraved Musical Scores (P Martin & C Bellissant) Readership: Computer scientists, engineers and neuroscientists. keywords:

Second IAPR Workshop, ANNPR 2006, Ulm, Germany, August 31-September 2, 2006, Proceedings

Pattern Recognition with Neural Networks in C++

From Statistics to Neural Networks

Pattern Recognition by Self-organizing Neural Networks

Neural Networks and Natural Intelligence

Develop New Insight into the Behavior of Adaptive Systems This one-of-a-kind interactive book and CD-ROM will help you develop a better understanding of the behavior of adaptive systems. Developed as part of a project aimed at innovating the teaching of adaptive systems in science and engineering, it unifies the concepts of neural networks and adaptive filters into a common framework. It begins by explaining the fundamentals of adaptive linear regression and builds on these concepts to explore pattern classification, function approximation, feature extraction, and time-series modeling/prediction. The text is integrated with the industry standard neural network/adaptive system simulator NeuroSolutions. This allows the authors to demonstrate and reinforce key concepts using over 200 interactive examples. Each of these examples is 'live,' allowing the user to change parameters and experiment first-hand with real-world adaptive systems. This creates a powerful environment for learning through both visualization and experimentation. Key Features of the Text The text and CD combine to become an interactive learning tool. Emphasis is on understanding the behavior of adaptive systems rather than mathematical derivations. Each key concept is followed by an interactive example. Over 200 fully functional simulations of adaptive systems are included. The text and CD offer a unified view of neural networks, adaptive filters, pattern recognition, and support vector machines. Hyperlinks allow instant access to keyword definitions, bibliographic references, equations, and advanced discussions of concepts. The CD-ROM Contains: A complete, electronic version of the text in hypertext format NeuroSolutions, an industry standard, icon-based neural network/adaptive system simulator A tutorial on how to use NeuroSolutions Additional data files to use with the simulator "An innovative approach to describing neurocomputing and adaptive learning systems from a perspective which unifies classical linear adaptive systems approaches with the modern advances in neural networks. It is rich in examples and practical insight." —James Zeidler, University of California, San Diego

Image Processing and Pattern Recognition covers major applications in the field, including optical character recognition, speech classification, medical imaging, paper currency recognition, classification reliability techniques, and sensor technology. The text emphasizes algorithms and architectures for achieving practical and effective systems, and presents many examples. Practitioners, researchers, and students in computer science, electrical engineering, and radiology, as well as those working at financial institutions, will value this unique and authoritative reference to diverse applications methodologies. Coverage includes: Optical character recognition Speech classification Medical imaging Paper currency recognition Classification reliability techniques Sensor technology Algorithms and architectures for achieving practical and effective systems are emphasized, with many examples illustrating the text. Practitioners, researchers, and students in computer science, electrical engineering, and radiology, as well as those working at financial institutions, will find this volume a unique and comprehensive reference source for this diverse applications area.

In a simple and accessible way it extends embedding field theory into areas of machine intelligence that have not been clearly dealt with before. Neural Networks for Pattern Recognition takes the pioneering work in artificial neural networks by Stephen Grossberg and his colleagues to a new level. In a simple and accessible way it extends embedding field theory into areas of machine intelligence that have not been clearly dealt with before. Following a tutorial of existing neural networks for pattern classification, Nigrin expands on these networks to present fundamentally new architectures that perform realtime pattern classification of embedded and synonymous patterns and that will aid in tasks such as vision, speech recognition, sensor fusion, and constraint satisfaction. Nigrin presents the new architectures in two stages. First he presents a network called Sonnet 1 that already achieves important properties such as the ability to learn and segment continuously varied input patterns in real time, to process patterns in a context sensitive fashion, and to learn new patterns without degrading existing categories. He then removes simplifications inherent in Sonnet 1 and introduces radically new architectures. These architectures have the power to classify patterns that may have similar meanings but that have different external appearances (synonyms). They also have been designed to represent patterns in a distributed fashion, both in short-term and long-term memory.

'Readers will emerge with a rigorous statistical grounding in the theory of how to construct and train neural networks in pattern recognition' New Scientist

The Adaptive Time-delay Neural Network

Biomedical Signal Processing and Pattern Recognition by Artificial Neural Networks

Advances in Pattern Recognition Systems Using Neural Network Technologies

Adaptive Biometric Systems

Annotation. Presents the latest research findings in theory, techniques, algorithms, and major applications of pattern recognition and computer vision, as well as new hardware and architecture aspects. Contains sections on basic methods in pattern recognition and computer vision, nine recognition applications, inspection and robotic applications, and architectures and technology. Some areas discussed include cluster analysis, 3D vision of dynamic objects, speech recognition, computer vision in food handling, and video content analysis and retrieval. This second edition is extensively revised to describe progress in the field since 1993. Chen is affiliated with the electrical and computer engineering department at the University of Massachusetts-Dartmouth. Annotation copyrighted by Book News, Inc., Portland, OR.

Adaptive Analog VLSI Neural Systems is the first practical book on neural networks learning chips and systems. It covers the entire process of implementing neural networks in VLSI chips, beginning with the crucial issues of learning algorithms in an analog framework and giving actual case studies of working systems. The approach is systems and applications oriented throughout, demonstrating the attractiveness of such an approach for applications such as adaptive pattern recognition and optical character recognition. Dr Jabri and his co-authors from AT&T Bell Laboratories, Bellcore and the University of Sydney provide a comprehensive introduction to VLSI neural networks suitable for research and development staff and advanced students.

This interdisciplinary volume presents a detailed overview of the latest advances and challenges remaining in the field of adaptive biometric systems. A broad range of techniques are provided from an international selection of pre-eminent authorities, collected together under a unified taxonomy and designed to be applicable to any pattern recognition system. Features: presents a thorough introduction to the concept of adaptive biometric systems; reviews systems for adaptive face recognition that perform self-updating of facial models using operational (unlabeled) data; describes a novel semi-supervised training strategy known as fusion-based co-training; examines the characterization and recognition of human gestures in videos; discusses a selection of learning techniques that can be applied to build an adaptive biometric system; investigates procedures for handling temporal variance in facial biometrics due to aging; proposes a score-level fusion scheme for an adaptive multimodal biometric system.

This volume, containing contributions by experts from all over the world, is a collection of 21 articles which present review and research material describing the evolution and recent developments of various pattern recognition methodologies, ranging from statistical, syntactic/linguistic, fuzzy-set-theoretic, neural, genetic-algorithmic and rough-set-theoretic to hybrid soft computing, with significant real-life applications. In addition, the book describes efficient soft machine learning algorithms for data mining and knowledge discovery. With a balanced mixture of theory, algorithms and applications, as well as up-to-date information and an extensive bibliography, Pattern Recognition: From Classical to Modern Approaches is a very useful resource. Contents: Pattern Recognition: Evolution of Methodologies and Data Mining (A Pal & S K Pal); Adaptive Stochastic Algorithms for Pattern Classification (M A L Thathachar & P S Sastry); Shape in Images (K V Mardia); Decision Trees for Classification: A Review and Some New Results (R Kothari & M Dong); Syntactic Pattern Recognition (A K Majumder & A K Ray); Fuzzy Sets as a Logic Canvas for Pattern Recognition (W Pedrycz & N Pizzi); Neural Network Based Pattern Recognition (V David Sanchez A); Networks of Spiking Neurons in Data Mining (K Cios & D M Sala); Genetic Algorithms, Pattern Classification and Neural Networks Design (S Bandyopadhyay et al.); Rough Sets in Pattern Recognition (A Skowron & R Swiniarski); Automated Generation of Qualitative Representations of Complex Objects by Hybrid Soft-Computing Methods (E H Ruspini & I S Zwir); Writing Speed and Writing Sequence Invariant On-line Handwriting Recognition (S-H Cha & S N Srihari); Tongue Diagnosis Based on Biometric Pattern Recognition Technology (K Wang et al.); and other papers. Readership: Graduate students, researchers and academics in pattern recognition.

A Prelude to Neural Networks

From Classical to Modern Approaches

Image Processing and Pattern Recognition

Neural Networks in Vision and Pattern Recognition

Ram-Based Neural Networks

Partial Contents: Attention and Expectation in Self-Organizing Learning and Recognition Systems: The Stability-Plasticity Dilemma and Adaptive Resonance Theory; Competitive Learning Models; Self-Stabilized Learning by an ART Architecture in an Arbitrary Input Environment; Attentional Priming and Prediction: Matching by the 2/3 Rule; Automatic Control of Hypothesis Testing by Attentional-Orienting Interactions; Learning to Recognize an Analog World; Invariant Visual Pattern Recognition; The Three R's: Recognition, Reinforcement, and Recall; Self-Stabilization of Speech Perception and Production Codes: New Light on Motor Theory; and Psychophysiological and Neurophysiological Predictions of ART.

Neural networks represent a new generation of information processing paradigms designed to mimic-in a very limited sense-the human brain. They can learn, recall, and generalize from training data, and with their potential applications limited only by the imaginations of scientists and engineers, they are commanding tremendous popularity and research interest. Over the last four decades, researchers have reported a number of neural network paradigms, however, the newest of these have not appeared in book form-until now. Recent Advances in Artificial Neural Networks collects the latest neural network paradigms and reports on their promising new applications. World-renowned experts discuss the use of neural networks in pattern recognition, color induction, classification, cluster detection, and more. Application engineers, scientists, and research students from all disciplines with an interest in considering neural networks for solving real-world problems will find this collection useful.

This is the first textbook on pattern recognition to present the Bayesian viewpoint. The book presents approximate inference algorithms that permit fast approximate answers in situations where exact answers are not feasible. It uses graphical models to describe probability distributions when no other books apply graphical models to machine learning. No previous knowledge of pattern recognition or machine learning concepts is assumed. Familiarity with multivariate calculus and basic linear algebra is required, and some experience in the use of probabilities would be helpful though not essential as the book includes a self-contained introduction to basic probability theory.

This series reviews research in natural and synthetic neural networks, as well as reviews research in modelling, analysis, design and development of neural networks in software and hardware areas. Contributions from researchers and practitioners aim to shape academic and professional programs in this area, and serve as a platform for detailed and expanded discussion of topics of interest to the neural network and cognitive information processing communities. This series should be of interest to those professionally involved in neural networks research, such as lecturers and primary investigators in neural computing, modelling, learning, memory and neurocomputers.

Adaptive Resonance Theory 1

Applied Artificial Higher Order Neural Networks for Control and Recognition

Neural Networks for Pattern Recognition

Neural Networks and Pattern Recognition

Self-organizing Neural Network Architectures for Real-time Adaptive Pattern Recognition

In recent years, Higher Order Neural Networks (HONNs) have been widely adopted by researchers for applications in control signal generating, pattern recognition, nonlinear recognition, classification, and predition of control and recognition scenarios. Due to the fact that HONNs have been proven to be faster, more accurate, and easier to explain than traditional neural networks, their applications are limitless. Applied Artificial Higher Order Neural Networks for Control and Recognition explores the ways in which higher order neural networks are being integrated specifically for intelligent technology applications. Emphasizing emerging research, practice, and real-world implementation, this timely reference publication is an essential reference source for researchers, IT professionals, and graduate-level computer science and engineering students.

This volume provides a resource for modern research on adaptive, learning, and pattern recognition systems. It provides background materials, and bridges the gap between today's 'second wave' of neural networks and the 'first wave' that occurred in the 1960s. This book offers the collective expertise of respected researchers, offering readers an authoritative yet accessible overview of learning theory and current research.
Chapter "Bounded Rational Decision-Making with Adaptive Neural Network Priors" is available open access under a Creative Commons Attribution 4.0 International License via link.springer.com.
Pulse-coupled neural networks; A neural network model for optical flow computation; Temporal pattern matching using an artificial neural network; Patterns of dynamic activity and timing in neural network processing; A macroscopic model of oscillation in ensembles of inhibitory and excitatory neurons; Finite state machines and recurrent neural networks: automata and dynamical systems approaches; biased random-waldk learning; a neurobiological correlate to trial-and-error; Using SONNET 1 to segment continuous sequences of items; On the use of high-level petri nets in the modeling of biological neural networks; Locally recurrent networks: the gmma operator, properties, and extensions.
Theory and Pattern Recognition Applications
Neural Smithing
Neural Networks and Adaptive Pattern Recognition
Adaptive Pattern Recognition Approach for Dynamic System Control Using Neural Networks
Handbook of Pattern Recognition & Computer Vision
Contents:A Connectionist Approach to Speech Recognition (Y Bengio)Signature Verification Using a "Siamese" Time Delay Neural Network (J Bromley et al.)Boosting Performance in Neural Networks (H Drucker et al.)An Integrated Architecture for Recognition of Totally Unconstrained Handwritten Numerals (A Gupta et al.)Time-Warping Network: A Neural Approach to Hidden Markov Model Based Speech Recognition (E Levin et al.)Computing Optical Flow with a Recurrent Neural Network (H Li & J Wang)Integrated Segmentation and Recognition through Exhaustive Scans or Learned Saccadic Jumps (G L Martin et al.)Experimental Comparison of the Effect of Order in Recurrent Neural Networks (C B Miller & C L Giles)Adaptive Classification by Neural Net Based Prototype Populations (K Peleg & U Ben-Hanan)A Neural System for the Recognition of Partially Occluded Objects in Cluttered Scenes: A Pilot Study (L Wiskott & C von der Malsburg)and other papers Readership: Computer scientists and engineers.
This book constitutes the refereed proceedings of the 8th IAPR TC3 International Workshop on Artificial Neural Networks in Pattern Recognition, ANNPR 2018, held in Siena, Italy, in September 2018. The 29 revised full papers presented together with 2 invited papers were carefully reviewed and selected from 35 submissions. The papers present and discuss the latest research in all areas of neural network- and machine learning-based pattern recognition. They are organized in two sections: learning algorithms and architectures, and applications. Chapter "Bounded Rational Decision-Making with Adaptive Neural Network Priors" is available open access under a Creative Commons Attribution 4.0 International License via link.springer.com.
Medical imaging is one of the heaviest funded biomedical engineering research areas. The second edition of Pattern Recognition and Signal Analysis in Medical Imaging brings sharp focus to the development of integrated systems for use in the clinical sector, enabling both imaging and the automatic assessment of the resultant data. Since the first edition, there has been tremendous development of new, powerful technologies for detecting, storing, transmitting, analyzing, and displaying medical images. Computer-aided analytical techniques, coupled with a continuing need to derive more information from medical images, has led to a growing application of digital processing techniques in cancer detection as well as elsewhere in medicine. This book is an essential tool for students and professionals, compiling and explaining proven and cutting-edge methods in pattern recognition for medical imaging. New edition has been expanded to cover signal analysis, which was only superficially covered in the first edition New chapters cover Cluster Validity Techniques, Computer-Aided Diagnosis Systems in Breast MRI, Spatio-Temporal Models in Functional, Contrast-Enhanced and Perfusion Cardiovascular MRI Gives readers an unparalleled insight into the latest pattern recognition and signal analysis technologies, modeling, and applications
Adaptive Pattern Recognition and Neural NetworksAddison Wesley Publishing Company
Development of Neural Network Architectures for Self-organizing Pattern Recognition and Robotics
Recent Advances in Artificial Neural Networks
Pattern Recognition and Signal Analysis in Medical Imaging
Artificial Neural Networks in Pattern Recognition
Adaptive Pattern Recognition and Neural Networks
Pattern Recognition by Self-Organizing Neural Networks presentsthe most recent advances in an area of research that is becoming vitally important in the fields ofcognitive science, neuroscience, artificial intelligence, and neural networks in general. The 19articles take up developments in competitive learning and computational maps, adaptive resonancetheory, and specialized architectures and biological connections. Introductorysurvey articles provide a framework for understanding the many models involved in various approachesto studying neural networks. These are followed in Part 2 by articles that form the foundation formodels of competitive learning and computational mapping, and recent articles by Kohonen, applyingthem to problems in speech recognition, and by Hecht-Nielsen, applying them to problems in designingadaptive lookup tables. Articles in Part 3 focus on adaptive resonance theory (ART) networks,selforganizing pattern recognition systems whose top-down template feedback signals guarantee theirstable learning in response to arbitrary sequences of input patterns. In Part 4, articles describeembedding ART modules into larger architectures and provide experimental evidence fromneurophysiology, event-related potentials, and psychology that support the prediction that ARTmechanisms exist in the brain. Contributors: J.-P. Banquet, G.A. Carpenter, S.Grossberg, R. Hecht-Nielsen, T. Kohonen, B. Kosko, T.W. Ryan, N.A. Schmajuk, W. Singer, D. Stork, C.von der Malsburg, C.L. Winter.
The NATO Advanced Study Institute From Statistics to Neural Networks, Theory and Pattern Recognition Applications took place in Les Arcs, Bourg Saint Maurice, France, from June 21 through July 2, 1993. The meeting brought to gether over 100 participants (including 19 invited lecturers) from 20 countries. The invited lecturers whose contributions appear in this volume are: L. Almeida (INESC, Portugal), G. Carpenter (Boston, USA), V. Cherkassky (Minnesota, USA), F. Fogelman Soulie (LRI, France), W. Freeman (Berkeley, USA), J. Friedman (Stanford, USA), F. Girosi (MIT, USA and IRST, Italy), S. Grossberg (Boston, USA), T. Hastie (AT&T, USA), J. Kittler (Surrey, UK), R. Lippmann (MIT Lincoln Lab, USA), J. Moody (OGI, USA), G. Palm (U1m, Germany), B. Ripley (Oxford, UK), R. Tibshirani (Toronto, Canada), H. Wechsler (GMU, USA), C. Wellekens (Eurecom, France) and H. White (San Diego, USA). The ASI consisted of lectures overviewing major aspects of statistical and neural network learning, their links to biological learning and non-linear dynamics (chaos), and real-life examples of pattern recognition applications. As a result of lively interactions between the participants, the following topics emerged as major themes of the meeting: (1) Unified framework for the study of Predictive Learning in Statistics and Artificial Neural Networks (ANNs); (2) Differences and similarities between statistical and ANN methods for non parametric estimation from examples (learning); (3) Fundamental connections between artificial learning systems and biological learning systems.
Neural networks and fuzzy techniques are among the most promising approaches to pattern recognition. Neuro-fuzzy systems aim at combining the advantages of the two paradigms. This book is a collection of papers describing state-of-the-art work in this emerging field. It covers topics such as feature selection, classification, classifier training, and clustering. Also included are applications of neuro-fuzzy systems in speech recognition, land mine detection, medical image analysis, and autonomous vehicle control. The intended audience includes graduate students in computer science and related fields, as well as researchers at academic institutions and in industry. Contents: Methodology:Simultaneous Feature Analysis and System Identification in a Neuro-Fuzzy Framework (N R Pal & D Chakraborty)Neuro-Fuzzy Model for Unsupervised Feature Extraction with Real Life Applications (R K De et al.)A Computational-Intelligence-Based Approach to Decision Support (M B Gorzalczany)Clustering Problem Using Fuzzy C-Means Algorithms and Unsupervised Neural Networks (J-S Lin)Automatic Training of Min-Max Classifiers (A Rizzi)Granular Computing in Pattern Recognition (W Pedrycz & G Vukovich)ART-Based Model Set for Pattern Recognition: FasArt Family (G I Sainz Palmero et al.)Applications:A Methodology and a System for Adaptive Speech Recognition in a Noisy Environment Based on Adaptive Noise Cancellation and Evolving Fuzzy Neural Networks (N Kasabov & G Iliev)Neural Versus Heuristic Development of Choquet Fuzzy Integral Fusion Algorithms for Land Mine Detection (P D Gader et al.)Automatic Segmentation of Multi-Spectral MR Brain Images Using a Neuro-Fuzzy Algorithm (S Y Lee et al.)Vision-Based Neuro-Fuzzy Control of Autonomous Lane Following Vehicle (Y-J Ryoo) Readership: Graduate students, lecturers and researchers in computer science and computer engineering. Keywords:Neuro-Fuzzy;Fuzzy Logic;Neural Networks;Pattern Recognition;Classification;Clustering;Decision Making;Uncertainty Management
"The book provides an up-to-date and authoritative treatment of pattern recognition and computer vision, with chapters written by leaders in the field. On the basic methods in pattern recognition and computer vision, topics range from statistical pattern recognition to array grammars to projective geometry to skeletonization, and shape and texture measures."--BOOK JACKET.
Pattern Recognition for the Diagnosis of Process Excitation and Controller Performance in Model-based Adaptive Process Control
Pattern Recognition Using Neural and Functional Networks
Neuro-Fuzzy Pattern Recognition
Pattern Recognition and Neural Networks
Neural and Adaptive Systems
Stephen Grossberg and his colleagues at Boston University's Center for Adaptive Systems are producing some of the most exciting research in the neural network approach to making computers "think." Packed with real-time computer simulations and rigorous demonstrations of these phenomena, this book includes results on vision, speech, cognitive information processing; adaptive pattern recognition, adaptive robotics, conditioning and attention, cognitive-emotional interactions, and decision making under risk.
This report describes the function, operation, test and evaluation of a Neural Network that accomplishes unsupervised learning of binary input patterns by classifying them using Adaptive Resonance Theory. Keywords: Machine learning; Artificial intelligence; Speech recognition; Character recognition; Pattern recognition; Acoustic differentiation; Detection; Adaptive filters; Pattern classification; Unsupervised learning; Neural network. (KT).
Characterization and Applications to Pattern Recognition, Prediction and Signal Processing
Pattern Recognition and Machine Learning
The ART of Adaptive Pattern Recognition by a Self-Organizing Neural Network. Revision
Handbook of Pattern Recognition and Computer Vision
8th IAPR TC3 Workshop, ANNPR 2018, Siena, Italy, September 19-21, 2018, Proceedings