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BRAUN NOBLE

Artificial Neural Networks in Pattern Recognition Addison Wesley Publishing Company
 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 together 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.
Evolving Spiking Neural Networks for Adaptive Audiovisual Pattern Recognition World Scientific
 Micromechanical manufacturing based on microequipment creates new possibilities in goods production. If microequipment sizes are comparable to the sizes of the microdevices to be produced, it is possible to decrease the cost of production drastically. The main components of the production cost - material, energy, space consumption, equipment, and maintenance - decrease with the scaling down of equipment sizes. To obtain really inexpensive production, labor costs must be reduced to almost zero. For this purpose, fully automated microfactories will be developed. To create fully automated microfactories, we propose using artificial neural networks having different structures. The simplest perceptron-like neural network can be used at the lowest levels of microfactory control systems. Adaptive Critic Design, based on neural network models of the microfactory objects, can be used for manufacturing process

optimization, while associative-projective neural networks and networks like ART could be used for the highest levels of control systems. We have examined the performance of different neural networks in traditional image recognition tasks and in problems that appear in micromechanical manufacturing. We and our colleagues also have developed an approach to microequipment creation in the form of sequential generations. Each subsequent generation must be of a smaller size than the previous ones and must be made by previous generations. Prototypes of first-generation microequipment have been developed and assessed.
Development of Neural Network Architectures for Self-organizing Pattern Recognition and Robotics World Scientific
 This book provides a thorough theoretical and practical introduction to the application of neural networks to pattern recognition and intelligent signal processing. It has been tested on students, unfamiliar with neural networks, who were able to pick up enough details to successfully complete their masters or final year undergraduate projects. The text also presents a comprehensive treatment of a class of neural networks called common bandwidth spherical basis function NNs, including the probabilistic NN, the modified probabilistic NN and the general regression NN. Contents: A Brief Historical Overview; Basic Concepts; ANN Performance Evaluation; Basic Pattern Recognition Principles; ADALINES, Adaptive Filters, and Multi-Layer Perceptrons; Probabilistic Neural Network Classifier; General Regression Neural Network; The Modified Probabilistic Neural Network; Advanced MPNN Developments; Neural Networks Similar to the Common Bandwidth Spherical Basis Function Regression ANNs; Unsupervised Learning Neural Networks; Other Neural Network Models; Statistical Learning Theory; Application to Intelligent Signal Processing; Application to Intelligent Control. Readership: Students and professionals in computer science and engineering.
Adaptive, Learning, and Pattern Recognition Systems Springer Science & Business Media
 Learning on Silicon combines models of adaptive information processing in the brain with advances in microelectronics technology and circuit design. The premise is to construct integrated systems not only loaded with sufficient computational power to handle demanding signal processing tasks in sensory perception and pattern recognition, but also capable of operating autonomously and robustly in unpredictable environments through mechanisms of adaptation and learning. This edited volume covers the spectrum of Learning on Silicon in five parts: adaptive sensory systems, neuromorphic learning, learning architectures, learning dynamics, and learning systems. The 18 chapters are documented with examples of fabricated systems, experimental results from silicon, and integrated applications

ranging from adaptive optics to biomedical instrumentation. As the first comprehensive treatment on the subject, Learning on Silicon serves as a reference for beginners and experienced researchers alike. It provides excellent material for an advanced course, and a source of inspiration for continued research towards building intelligent adaptive machines.

Adaptive Pattern Recognition World Scientific
 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.
Neuro-fuzzy Pattern Recognition Springer Science & Business Media
 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 limited precision effects, 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.

Neural Networks for Intelligent Signal Processing Springer Science & Business Media

Neural networks are members of a class of software that have the potential to enable intelligent computational systems capable of simulating characteristics of biological thinking and learning. Currently no standards exist to verify and validate neural network-based systems. NASA Independent Verification and Validation Facility has contracted the Institute for Scientific Research, Inc. to perform research on this topic and develop a comprehensive guide to performing V&V on adaptive systems, with emphasis on neural networks used in safety-critical or mission-critical applications. Methods and Procedures for the Verification and Validation of Artificial Neural Networks is the culmination of the first steps in that research. This volume introduces some of the more promising methods and techniques used for the verification and validation (V&V) of neural networks and adaptive systems. A comprehensive guide to performing V&V on neural network systems, aligned with the IEEE Standard for Software Verification and Validation, will follow this book.

From Statistics to Neural Networks Cambridge University Press

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

Adaptive Pattern Recognition Approach for Dynamic System Control Using Neural Networks World Scientific

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.

Pattern Recognition and Classification Using Adaptive Linear Neuron Devices SPIE Press

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.

The Adaptive Time-delay Neural Network Springer

Pattern Recognition by Self-Organizing Neural Networks presents the most recent advances in an area of research that is becoming vitally important in the fields of cognitive science, neuroscience, artificial intelligence, and neural networks in general. The 19 articles take up developments in competitive learning and computational maps, adaptive resonance theory, and specialized architectures and biological connections. Introductory survey articles provide a framework for understanding the many models involved in various approaches to studying neural networks. These are followed in Part 2 by articles that form the foundation for models of competitive learning and computational mapping, and recent articles by Kohonen, applying them to problems in speech recognition, and by Hecht-Nielsen, applying them to problems in designing adaptive lookup tables. Articles in Part 3 focus on adaptive resonance theory (ART) networks, self-organizing pattern recognition systems whose top-down template feedback signals guarantee their stable learning in response to arbitrary sequences of input patterns. In Part 4, articles describe embedding ART modules into larger architectures and provide experimental evidence from neurophysiology, event-related potentials, and psychology that support the prediction

that ART mechanisms 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.

Artificial Neural Networks in Pattern Recognition Psychology Press Adaptive, learning, and pattern recognition systems; theory and applications.

Learning on Silicon Springer Science & Business Media

Soft Computing Approach to Pattern Classification and Object Recognition establishes an innovative, unified approach to supervised pattern classification and model-based occluded object recognition. The book also surveys various soft computing tools, fuzzy relational calculus (FRC), genetic algorithm (GA) and multilayer perceptron (MLP) to provide a strong foundation for the reader. The supervised approach to pattern classification and model-based approach to occluded object recognition are treated in one framework, one based on either a conventional interpretation or a new interpretation of multidimensional fuzzy implication (MFI) and a novel notion of fuzzy pattern vector (FPV). By combining practice and theory, a completely independent design methodology was developed in conjunction with this supervised approach on a unified framework, and then tested thoroughly against both synthetic and real-life data. In the field of soft computing, such an application-oriented design study is unique in nature. The monograph essentially mimics the cognitive process of human decision making, and carries a message of perceptual integrity in representational diversity. Soft Computing Approach to Pattern Classification and Object Recognition is intended for researchers in the area of pattern classification and computer vision. Other academics and practitioners will also find the book valuable.

A Stand-alone, High-resolution, Adaptive Pattern Recognition System CRC Press

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.

Computational and Clinical Approaches to Pattern Recognition and Concept Formation Springer

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.

Ram-based Neural Networks Springer Science & Business Media

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.

Neural Networks for Pattern Recognition MIT Press

The ninth volume in this highly acclaimed series discusses the computational and clinical approaches to pattern recognition and concept formation regarding: visual and spatial processing models; computational models, templates and hierarchical models. An ideal reference for students and professionals in experimental psychology and behavioral analysis.

Methods for Adaptive Pattern Recognition John Wiley & Sons

Statistical pattern recognition; Probability density estimation; Single-layer networks; The multi-layer perceptron; Radial basis functions; Error functions; Parameter optimization algorithms; Pre-processing and feature extraction; Learning and generalization; Bayesian techniques; Appendix; References; Index.

Adaptive Pattern Recognition in a Real-world Environment Oxford University Press

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.

Research in Adaptive Pattern Recognition World Scientific

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.