Reti Neurali E Neurofuzzy

In this edited book various novel approaches to problems of current interest in civil engineering are demonstrated. The topics range from dynamic band seismic problems to the analysis of long-span structures and ancient buildings. Experts associated within the Lagrange Laboratory present recent research results on functionally-graded or composite materials, granular materials, geotechnics, as well as frictional or adhesive contact problems.

The book presents a clear understanding of a new type of computation system, the Cellular Neural Network (CNN), which has been successfully applied to the solution of many heavy computation problems, mainly in the fields of image processing and complex partial differential equations. The text describes how CNN will improve the soft-computation toolbox, and examines the many applications of soft computing to complex systems.

Questo volume tende a stimolare una riflessione teorica e metodologica sul lavoro di prevenzione condotto dai Servizi per le Tossicodipendenze delle Aziende sanitarie pubbliche e da altre agenzie sia pubbliche che private impegnate nel campo psico-sociale. Partendo dallo studio di progetti di prevenzione, soprattutto nordamericani, e dalla possibilità di applicazione scientifica di alcuni modelli matematici all'attività di prevenzione - con particolare attenzione alle reti neurali artificiali - viene presentata l'esperienza del Progetto Sonda (progetto di prevenzione dei comportamenti auto ed eterodistruttivi ideato dal Centro Ricerche Semeion e adottato in varie realtà locali italiane fin dal 1991) e prospettate le linee-guida per il lavoro futuro. (Gruppo Abele).

This textbook presents a practical approach to predictive analytics for classroom learning. It focuses on using analytics to solve business problems and compares several different modeling techniques, all explained from examples using the SAS Enterprise Miner software. The authors demystify complex algorithms to show how they can be utilized and explained within the context of enhancing business opportunities. Each chapter includes an opening vignette that provides real-life example of how business analytics have been used in various aspects of organizations to solve issue or improve their results. A running case provides an example of a how to build and analyze a complex analytics model and utilize it to predict future outcomes.

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Deep learning is often viewed as the exclusive domain of math PhDs and big tech companies. But as this hands-on guide demonstrates, programmers comfortable with Python can achieve impressive results in deep learning with little math background, small amounts of data, and minimal code. How? With fastai, the first library to provide a consistent interface to the most frequently used deep learning applications. Authors Jeremy Howard and Sylvain Gugger, the creators of fastai, show you how to train a model on a wide range of tasks using fastai and PyTorch. You'll also dive progressively further into deep learning theory to gain a complete understanding of the algorithms behind the scenes. Train models in computer vision, natural language processing, tabular data, and collaborative filtering Learn the latest deep learning techniques that matter most in practice Improve accuracy, speed, and reliability by understanding how deep learning models work Discover how to turn your models into web applications Implement deep learning algorithms from scratch Consider the ethical implications of your work Gain insight from the foreword by PyTorch cofounder, Soumith Chintala

Neural networks are a computing paradigm that is finding increasing attention among computer scientists. In this book, theoretical laws and

models previously scattered in the literature are brought together into a general theory of artificial neural nets. Always with a view to biology and starting with the simplest nets, it is shown how the properties of models change when more general computing elements and net topologies are introduced. Each chapter contains examples, numerous illustrations, and a bibliography. The book is aimed at readers who seek an overview of the field or who wish to deepen their knowledge. It is suitable as a basis for university courses in neurocomputing.
The second of a four-volume set of conference proceedings. This one covers modelling transport systems, with 35 papers organized hierarchically on traffic models, urban models, regional models, and national models.
With the reinvigoration of neural networks in the 2000s, deep learning has become an extremely active area of research, one that's paving the way for modern machine learning. In this practical book, author Nikhil Buduma provides examples and clear explanations to guide you through major concepts of this complicated field. Companies such as Google, Microsoft, and Facebook are actively growing in-house deep-learning teams. For the rest of us, however, deep learning is still a pretty complex and difficult subject to grasp. If you're familiar with Python, and have a background in calculus, along with a basic understanding of machine learning, this book will get you started. Examine the foundations of machine learning and neural networks Learn how to train feed-forward neural networks Use TensorFlow to implement your first neural network Manage problems that arise as you begin to make networks deeper Build neural networks that analyze complex images Perform effective dimensionality reduction using autoencoders Dive deep into sequence analysis to examine language Learn the fundamentals of reinforcement learning
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The first systematic study of parallelism in computation by two pioneers in the field. Reissue of the 1988 Expanded Edition with a new foreword by Léon Bottou In 1969, ten years after the discovery of the perceptron—which showed that a machine could be taught to perform certain tasks using examples—Marvin Minsky and Seymour Papert published Perceptrons, their analysis of the computational capabilities of perceptrons for specific tasks. As Léon Bottou writes in his foreword to this edition, "Their rigorous work and brilliant technique does not make the perceptron look very good." Perhaps as a result, research turned away from the perceptron. Then the pendulum swung back, and machine learning became the fastest-growing field in computer science. Minsky and Papert's insistence on its theoretical foundations is newly relevant. Perceptrons—the first systematic study of parallelism in computation—marked a historic turn in artificial intelligence, returning to the idea that intelligence might emerge from the activity of networks of neuron-like entities. Minsky and Papert provided mathematical analysis that showed the limitations of a class of computing machines that could be considered as models of the brain. Minsky and Papert added a new chapter in 1987 in which they discuss the state of parallel computers, and note a central theoretical challenge: reaching a deeper understanding of how "objects" or "agents" with individuality can emerge in a network. Progress in this area would link connectionism with what the authors have called "society theories of mind."
The first ICANNGA conference, devoted to biologically inspired computational paradigms, Neural Net works and Genetic

Algorithms, was held in Innsbruck, Austria, in 1993. The meeting attracted researchers from all over Europe and further afield, who decided that this particular blend of topics should form a theme for a series of biennial conferences. The second meeting, held in Ales, France, in 1995, carried on the tradition set in Innsbruck of a relaxed and stimulating environment for the. exchange of ideas. The series has continued in Norwich, UK, in 1997, and Portoroz, Slovenia, in 1999. The Institute of Computer Science, Czech Academy of Sciences, is pleased to host the fifth conference in Prague. We have chosen the Liechtenstein palace under the Prague Castle as the conference site to enhance the traditionally good atmosphere of the meeting. There is an inspirational genius loci of the historical center of the city, where four hundred years ago a fruitful combination of theoretical and empirical method, through the collaboration of Johannes Kepler and Tycho de Brahe, led to the discovery of the laws of planetary orbits.

This volume contains the proceedings of the 12th Italian Workshop on Neural Nets WIRN VIETRI-Ol, jointly organized by the International Institute for Advanced Scientific Studies "Eduardo R. Caianiello" (IIASS), the Societa Italiana Reti Neuroniche (SIREN), the IEEE NNC Italian RIG and the Italian SIG of the INNS. Following the tradition of previous years, we invited three foreign scientists to the workshop, Dr. G. Indiveri and Professors A. Roy and R. Sun, who respectively presented the lectures "Computation in Neuromorphic Analog VLSI Systems", "On Connectionism and Rule Extraction", "Beyond Simple Rule Extraction: Acquiring Planning Knowledge from Neural Networks" (the last two papers being part of the special session mentioned below). In addition, a review talk was presented, dealing with a very up-to-date topic: "NeuroJuzzy Approximator based on Mamdani's Model". A large part of the book contains original contributions approved by referees as oral or poster presentations, which have been assembled for reading convenience into three sections: Architectures and Algorithms, Image and Signal Processing, and Applications. The last part of the books contains the papers of the special Session "From Synapses to Rules". Our thanks go to Prof. B. Apolloni, who organized this section. Furthermore, two sections are dedicated to the memory of two great scientists who were friends in life, Professors Mark Aizerman and Eduardo R. Caianiello. The editors would like to thank the invited speakers, the review lecturers and all the contributors whose highly qualified papers helped with the success of the workshop.

ARCHEOSEMA, a meta-disciplinary project of theoretical, analytical and experimental archaeology, has been recently awarded by La Sapienza University of Rome. The project title is an acronym which sums up its two main theoretical foundations: the openness of modern archaeology (ARCHEO) to the analysis of physical, historical, linguistic signs (SEMA) underlying natural and cultural systems reconstructed and simulated through Artificial Sciences. This volume edited by Marco Ramazzotti, a Supplement to «Archeologia e Calcolatori», is a Special Issue dedicated to the memory of the English archaeologist David Leonard Clarke (1937-1976), and is a further attempt to collect some applicative studies

of complex natural and cultural phenomena following the Artificial Intelligence computational models through the lens of Analytical Archaeology.

This book is an edited selection of the papers presented at the International Workshop on VLSI for Artifidal Intelligence and Neural Networks which was held at the University of Oxford in September 1990. Our thanks go to all the contributors and especially to the programme committee for all their hard work. Thanks are also due to the ACM-SIGARCH, the IEEE Computer Society, and the lEE for publicizing the event and to the University of Oxford and SUNY-Binghamton for their active support. We are particularly grateful to Anna Morris, Maureen Doherty and Laura Duffy for coping with the administrative problems. Jose Delgado-Frias Will Moore April 1991 vii PROLOGUE Artificial intelligence and neural network algorithms/computing have increased in complexity as well as in the number of applications. This in tum has posed a tremendous need for a larger computational power than can be provided by conventional scalar processors which are oriented towards numeric and data manipulations. Due to the artificial intelligence requirements (symbolic manipulation, knowledge representation, non-deterministic computations and dynamic resource allocation) and neural network computing approach (non-programming and learning), a different set of constraints and demands are imposed on the computer architectures for these applications.

A comprehensive introduction to new approaches in artificial intelligence and robotics that are inspired by self-organizing biological processes and structures. New approaches to artificial intelligence spring from the idea that intelligence emerges as much from cells, bodies, and societies as it does from evolution, development, and learning. Traditionally, artificial intelligence has been concerned with reproducing the abilities of human brains; newer approaches take inspiration from a wider range of biological structures that that are capable of autonomous self-organization. Examples of these new approaches include evolutionary computation and evolutionary electronics, artificial neural networks, immune systems, biorobotics, and swarm intelligence—to mention only a few. This book offers a comprehensive introduction to the emerging field of biologically inspired artificial intelligence that can be used as an upper-level text or as a reference for researchers. Each chapter presents computational approaches inspired by a different biological system; each begins with background information about the biological system and then proceeds to develop computational models that make use of biological concepts. The chapters cover evolutionary computation and electronics; cellular systems; neural systems, including neuromorphic engineering; developmental systems; immune systems; behavioral systems—including several approaches to robotics, including behavior-based, bio-mimetic, epigenetic, and evolutionary robots; and collective systems, including swarm robotics as well as cooperative and competitive co-evolving systems. Chapters end with a concluding overview and suggested reading.

First published in 1998, this volume enters the debate on human behaviour in the form of neural networks in a spatial context. As most transportation research techniques had been developed in the 1960s and 1970s, these authors sought to bring that research

into the modern era. Featuring 17 articles from 37 contributors, it begins with an overview and proceeds to examine aspects of travel behaviour, traffic flow and traffic management.

This is an introduction to spiking neurons for advanced undergraduate or graduate students. It can be used with courses in computational neuroscience, theoretical biology, neural modeling, biophysics, or neural networks. It focuses on phenomenological approaches rather than detailed models in order to provide the reader with a conceptual framework. No prior knowledge beyond undergraduate mathematics is necessary to follow the book. Thus it should appeal to students or researchers in physics, mathematics, or computer science interested in biology; moreover it will also be useful for biologists working in mathematical modeling.

This volume directly addresses the complexities involved in data mining and the development of new algorithms, built on an underlying theory consisting of linear and non-linear dynamics, data selection, filtering, and analysis, while including analytical projection and prediction. The results derived from the analysis are then further manipulated such that a visual representation is derived with an accompanying analysis. The book brings very current methods of analysis to the forefront of the discipline, provides researchers and practitioners the mathematical underpinning of the algorithms, and the non-specialist with a visual representation such that a valid understanding of the meaning of the adaptive system can be attained with careful attention to the visual representation. The book presents, as a collection of documents, sophisticated and meaningful methods that can be immediately understood and applied to various other disciplines of research. The content is composed of chapters addressing: An application of adaptive systems methodology in the field of post-radiation treatment involving brain volume differences in children; A new adaptive system for computer-aided diagnosis of the characterization of lung nodules; A new method of multi-dimensional scaling with minimal loss of information; A description of the semantics of point spaces with an application on the analysis of terrorist attacks in Afghanistan; The description of a new family of meta-classifiers; A new method of optimal informational sorting; A general method for the unsupervised adaptive classification for learning; and the presentation of two new theories, one in target diffusion and the other in twisting theory.

An introduction to a broad range of topics in deep learning, covering mathematical and conceptual background, deep learning techniques used in industry, and research perspectives. “Written by three experts in the field, Deep Learning is the only comprehensive book on the subject.” —Elon Musk, cochair of OpenAI; cofounder and CEO of Tesla and SpaceX Deep learning is a form of machine learning that enables computers to learn from experience and understand the world in terms of a hierarchy of concepts. Because the computer gathers knowledge from experience, there is no need for a human computer operator to formally specify all the knowledge that the computer needs. The hierarchy of concepts allows the computer to learn complicated concepts by building them out of simpler ones; a graph of these hierarchies would be many layers deep. This book introduces a broad range of topics in deep learning. The text offers mathematical and conceptual background, covering relevant concepts in linear algebra, probability theory and information theory, numerical computation, and machine learning. It describes deep learning techniques

used by practitioners in industry, including deep feedforward networks, regularization, optimization algorithms, convolutional networks, sequence modeling, and practical methodology; and it surveys such applications as natural language processing, speech recognition, computer vision, online recommendation systems, bioinformatics, and videogames. Finally, the book offers research perspectives, covering such theoretical topics as linear factor models, autoencoders, representation learning, structured probabilistic models, Monte Carlo methods, the partition function, approximate inference, and deep generative models. Deep Learning can be used by undergraduate or graduate students planning careers in either industry or research, and by software engineers who want to begin using deep learning in their products or platforms. A website offers supplementary material for both readers and instructors.

Surprising tales from the scientists who first learned how to use computers to understand the workings of the human brain. Since World War II, a group of scientists has been attempting to understand the human nervous system and to build computer systems that emulate the brain's abilities. Many of the early workers in this field of neural networks came from cybernetics; others came from neuroscience, physics, electrical engineering, mathematics, psychology, even economics. In this collection of interviews, those who helped to shape the field share their childhood memories, their influences, how they became interested in neural networks, and what they see as its future. The subjects tell stories that have been told, referred to, whispered about, and imagined throughout the history of the field. Together, the interviews form a Rashomon-like web of reality. Some of the mythic people responsible for the foundations of modern brain theory and cybernetics, such as Norbert Wiener, Warren McCulloch, and Frank Rosenblatt, appear prominently in the recollections. The interviewees agree about some things and disagree about more. Together, they tell the story of how science is actually done, including the false starts, and the Darwinian struggle for jobs, resources, and reputation. Although some of the interviews contain technical material, there is no actual mathematics in the book. Contributors James A. Anderson, Michael Arbib, Gail Carpenter, Leon Cooper, Jack Cowan, Walter Freeman, Stephen Grossberg, Robert Hecht-Neilsen, Geoffrey Hinton, Teuvo Kohonen, Bart Kosko, Jerome Lettvin, Carver Mead, David Rumelhart, Terry Sejnowski, Paul Werbos, Bernard Widrow

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