Neural Networks for Optimization and Signal Processing

Description:
Neural Networks for Optimization and Signal Processing A. Cichocki Warsaw University of Technology Poland R. Unbehauen Universität Erlangen–Nürnberg Germany Artificial neural networks can be employed to solve a wide spectrum of problems in optimization, parallel computing, matrix algebra and signal processing. Taking a computational approach, this book explains how ANNs provide solutions in real time, and allow the visualization and development of new techniques and architectures. Features include:

* A guide to the fundamental mathematics of neurocomputing.
* A review of neural network models and an analysis of their associated algorithms.
* State-of-the-art procedures to solve optimization problems.
* Computer simulation programs MATLAB, TUTSIM and SPICE illustrate the validity and performance of the algorithms and architectures described. The authors encourage the reader to be creative in visualizing new approaches and detail how other specialized computer programs can evaluate performance.
* Each chapter concludes with a short bibliography.
* Illustrative worked examples, questions and problems assist self study.

The authors' self–contained approach will appeal to a wide range of readers, including professional engineers working in computing, optimization, operational research, systems identification and control theory. Undergraduate and postgraduate students in computer science, electrical and electronic engineering will also find this text invaluable. In particular, the text will be ideal to supplement courses in circuit analysis and design, adaptive systems, control systems, signal processing and parallel computing. B.G. Teubner Stuttgart

Contents:
Mathematical Preliminaries of Neurocomputing.
Architectures and Electronic Implementation of Neural Network Models.
Unconstrained Optimization and Learning Algorithms.
Neural Networks for Linear, Quadratic Programming and Linear Complementarity Problems.
A Neural Network Approach to the On–Line Solution of a System of Linear Algebraic Equations and Related Problems.
Neural Networks for Matrix Algebra Problems.
Neural Networks for Continuous, Nonlinear, Constrained Optimization Problems.
Neural Networks for Estimation, Identification and Prediction.
Neural Networks for Discrete and Combinatorial Optimization Problems.
Appendices.
Subject Index.

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