

Books in Brief

Neural Networks in Bioprocessing and Chemical Engineering—D. Richard Baughman and Yin An Liu. (San Diego, CA: Academic, 1995, 508 pages, hardbound, \$69.95, ISBN 0-12-083030-2).

This book introduces the fundamental principles and practical aspects of neural networks, focusing on their application in bioprocessing and chemical engineering. The book also focuses on the implementation of neural networks using commercially available, user-friendly, PC-based software tools, rather than predominantly on theory. The book is intended as a self-study guide for practicing biotechnologists and chemical engineers who wish to learn about neural networks, and to senior or graduate students.

The book includes 10 detailed case studies of neural network applications in bioprocessing and chemical engineering, such as process fault-diagnosis of a chemical reactor, classification of protein secondary-structure categories, quantitative prediction and regression analysis of complex chemical kinetics, quality control and optimization of an autoclave curing process for manufacturing composite materials, and predictive modeling of an experimental batch fermentation process. The authors provide the reader with detailed specifications of the structures and training procedures for all neural network examples discussed in the book. The book also includes a diskette of the input data files for all illustrative examples, practice problems, and case studies.

The book consists of six chapters and concludes with an appendix on the connections between neural networks and multivariate statistical methods. The book also includes a glossary section and a subject index. The contents are as follows: Introduction to Neural Networks; Fundamental and Practical Aspects of Neural Computing; Classification: Fault Diagnosis and Feature Categorization; Prediction and Optimization; Process Forecasting, Modeling, and

Control of Time-Dependent Systems; and Development of Expert Networks: A Hybrid System of Expert Systems and Neural Networks.

Solving Problems in Environmental Engineering and Geosciences with Artificial Neural Networks—Farid U. Dowla and Leah L. Rogers. (Cambridge, MA: MIT Press, 1995, 246 pages, hardbound, \$40.00, ISBN 0-262-04148-0).

This book illustrates how artificial neural networks can be used in solving problems in environmental engineering and the geosciences. The book's aim is to reach those who are working within environmental engineering and geosciences and, by exposing them to the example problems covered, it is hoped that they may find advantages in their work from using neural computing.

The book provides enough detail, including theoretical development and algorithmic codes, to enable readers unexposed to neural networks to begin applying them. The algorithms provided are in the C language and the authors assume that the reader has some fluency in computer programming.

The book consists of 12 chapters and an index. The contents are as follows: Introduction; Neural Network: Methods and Algorithms; Training Set and Input Representation; Optimal Groundwater Remediation; Discriminating Natural Earthquakes from Underground Nuclear Explosions; Automated Monitoring of Seismic, Acoustic, and Biomedical Signals; Strength Estimation of Seismic Sources; Spatial Estimation for Geologic Characterization; Lithology Prediction for Geologic Characterization; Forecasting or Early Warning of Earthquakes; Climate Changes; and Full Circle.