

case studies, but many brief anecdotes (i.e. a few sentences) usually given without supporting references. Although this approach is very readable, it reflects a use of evidence for which most students would be penalized in essays. I also suspect that those without some experience of IS within organizations may find it difficult to engage with the material, particularly in regard to the chapters on integrity and system development.

This book would be a useful complement to a more traditional text for degree-level teaching. OR practitioners may find it a stimulating reminder of the boundaries of what computers can and cannot do.

STEVE NEW

**Neural Networks: Algorithms, Applications and Programming Techniques**

JAMES A. FREEMAN and DAVID M. SKAPURA

*Addison-Wesley, Wokingham, 1991. xiii + 401 pp. £39.55*

ISBN 0 201 51376 5

Neural Networks was a very interesting topic at OR 1991. Many very interesting results were presented at this meeting. During the presentations the question which continuously ran through my mind was: how available would these techniques be to the average, greatly-overworked, analyst? After reading Freeman and Skapura's book, I can safely answer my question. Their book makes available many of the important neural networking techniques in a thoroughly understandable manner.

The book is divided into several topics. They are Adaline and Madaline, Backpropagation, the BAM and Hopfield Memory, Simulated Annealing, the Counterpropagation Network, Self-Organizing Maps, Adaptive Resonance Theory, Spatiotemporal Pattern Classification, and Neocognition. Each of these topics is a separate section in the book and can be read separately on an as-needed basis.

Included in each section is a brief physical or neurological description of the process to be discussed. Ample diagrams of the process are incorporated within the discussion. This is then followed by the mathematics to be used along with an example. The algorithm is then reviewed and finally a program is given which can be used to automate the process for the user. It is almost as easy to follow as a cookbook.

Neural networks in my opinion appear to be the next generation in numerical analysis. Some of the topics such as Backpropagation, BAM and Simulated Annealing are most useful in regression analysis and offer insights which are worth investigating when one is seeking functional relationships. The other topics are not to be neglected either, as there is enough material available to determine additional OR applications.

In summary, I was very pleased with the text and recommend it to all OR analysts. It is easy to understand, well organized and full of possible OR applications.

CHARLES LEAVE

**The Engineering Statistician's Guide to Continuous Bivariate Distributions**

T. P. HUTCHINSON and C. D. LAI

*Rumsby Scientific Publishing, Adelaide, Australia, 1991. 346 + xxii pp. \$44 (Australian), \$32 (US)*

ISBN 0 646 02413 2

**Continuous Bivariate Distributions, Emphasising Applications**

T. P. HUTCHINSON and C. D. LAI

*Rumsby Scientific Publishing, Adelaide, Australia, 1990. 412 + xxxi pp. £38 or \$88 (Australian)*

ISBN 0 7316 7206 2

Much of the theory of statistics is based on univariate distributions. However, many real life problems require a multivariate analysis. The multivariate distribution about which we know the