

# Short Book Reviews

Editor: Simo Puntanen

## **A Statistical Approach to Neural Networks for Pattern Recognition**

Robert A. Dunne

Wiley, 2007, xvii + 268 pages, £ 47.50 / € 67.70, hardcover

ISBN: 978-0-471-74108-4

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*Readership:* Students and professionals in mathematics, statistics, computer science, and electrical engineering.

In the preface, Robert Dunne describes neural networks or multilayer perceptrons as statistical concepts under a different terminology. I think this is exactly right. Although, in their early days, emphasis was on the network representation, various statisticians rapidly made it clear that this was just another way of looking at what were effectively rather complicated nonlinear statistical models. The statistical input also led to a deeper understanding of issues such as overfitting which bedevilled early presentations by neural network enthusiasts. (I recall attending more than one in which ‘100% predictive accuracy’ was reported with enthusiasm.)

This book arose from the author’s efforts in recasting descriptions of neural networks in statistical terms. The first five chapters describe neural network models and relate them to earlier statistical models. Chapters 6 and 7 describe how to apply them to problems with large numbers of classes and some image problems; these are the sorts of problems most often encountered by the author. Chapters 8 through 10 explore the robustness of the models. This is always an important issue for highly flexible modeling methods. The last three chapters describe further extensions to the basic approach.

The book provides an excellent introduction to neural networks from a statistical perspective. It would make ideal reading for a graduate student or researcher about to enter the area, or someone who wished to have a very sound grasp of this class of models in order to apply them effectively.

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