

BOOK REVIEWS

EDITOR:
M. S. RIDOUT

- An Invariant Approach to the Statistical Analysis of Shapes**
(S. R. Lele and J. T. Richtsmeier) *I. L. Dryden*
- Statisticians of the Centuries**
(C. C. Heyde and E. Seneta, eds.) *N. J. Cox*
- Statistical Methods in Spatial Epidemiology**
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- A Handbook of Statistical Analyses using SAS, 2nd Edition**
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- Complexity in Biological Information Processing**
(Novartis Foundation)
- Resampling Methods: A Practical Guide to Data Analysis, 2nd edition**
(P. I. Good)
- Sequential Monte Carlo Methods in Practice**
(A. Doucet, N. De Freitas and N. Gordon, eds.)
- FIM-II, Forum for Interdisciplinary Mathematical Proceedings on Combinatorics, Statistics, Pattern Recognition and Related Areas, Volume II**
(S. N. Mishra and B. D. Sharma, eds.)
- Spatial Statistics: Methodological Aspects and Applications**
(M. Moore, ed.)
- Empirical Bayes and Likelihood Inference**
(S. E. Ahmed and N. Reid, eds.)

LELE, S. R. and RICHTSMEIER, J. T. **An Invariant Approach to the Statistical Analysis of Shapes**. Chapman & Hall/CRC, Boca Raton, Florida, 2001. ix + 308 pp. £48.99/\$69.95. ISBN 0-8493-0319-2.

The book introduces the most detailed and comprehensive treatment of the collection of methods known as Euclidean Distance Matrix Analysis (EDMA) for studying shape. The basic idea of EDMA is to carry out statistical analysis of the matrices of inter-landmark distances using method of moments bias corrections under Gaussian model assumptions, and then use multidimensional scaling for obtaining shape estimates of the required dimension. The authors have been at the forefront of developments and the most vociferous propo-

nents of the technique. The style is quite personalized and authors are forthright in their opinions.

The monograph is at least two books in one, and in particular the major Chapters 2 to 4, are each divided into 4 parts. First, there is a book aimed at biologists—including part 1 of the major chapters. Then, there is the book aimed more at statisticians—including part 2 of the major chapters. The dual style is quite novel, but also a little disorientating at times, involving regular flicking backwards and forwards between the pages.

The main methodology is presented in Chapters 3 and 4, with this work primarily being a survey of the papers by the authors and their colleagues. The authors are very c

cal of Procrustes analysis, and indeed it is valuable to point out the limitations of methods. However, biologists and applied researchers may get a confused impression that Procrustes methods should never be used. Procrustes methods are closely related to methods based on natural distances in the non-Euclidean shape space, and there is a growing body of theory on the properties of Procrustes based methods for shape analysis, including further consistency theorems. However, the concept of 'mean shape' (Fréchet mean) from the offset normal distribution is not necessarily equal to the 'shape of the means', which is the concept of mean shape in the book. So, I think more work needs to be done before definitive positive and negative answers are known.

There are lots of examples throughout, and in particular the new molecular structures examples in the chapter by Theodore Cole are very interesting. A large amount of analysis is presented in tables as opposed to graphical format, which is quite hard to digest, but nevertheless it is interesting to read about the wide range of applications of the methodology.

In conclusion, this is a useful and complementary addition to the recent series of books on statistical shape analysis.

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HEYDE, C. C. and SENETA, E. (editors). *Statisticians of the Centuries*. Springer, New York, 2001. xii + 500 pp. £31.50/\$45.95. ISBN 0-387-95283-7 (pbk); £49.00/\$69.95. ISBN 0-387-95329-9 (hbk).

The history of statistics has always been of considerable interest to many practitioners, but until relatively recently there were only a few books available. Now monographs and surveys appear frequently from both statisticians and historians of science. This volume (hereafter HS), prepared under the auspices of the International Statistical Institute, offers short biographies by 75 authors (whose affiliations are not given) of 103 individuals who contributed substantially to statistical science and were born before 1900. Anyone fascinated by the history of statistics will find HS most enjoyable and useful; those with a weaker interest are still urged to recommend it for their institutional library. Either way, it is a key reference for idle browsing, for seeking colourful or prosaic detail for that lecture or paper, or for trying to sort out those perennial questions such as 'Who was Student?' or 'Which Bernoulli did what?'

It may be helpful to compare HS with some other resources. Johnson and Kotz (1997) (hereafter JK) is based on obituaries published in the original and update volumes of the *Encyclopedia of Statistical Sciences*. The *Encyclopedia of Biostatistics*, edited by Armitage and Colton (1998) (AC), also includes many obituaries. Some people appear in just one or two of these volumes, partly because both JK and AC include people born after 1900. Even the decade to 1910 includes giants such as Bartlett, Cochran, de Finetti, Feller, M. G. Kendall, Kolmogorov, Wald, Wilks, Wold and Yates—some indication of what is missed by a 1900 cut-off—but it appears that HS is the first of a series. In addition, a weak entry in one volume is often compensated by a stronger entry in another, so these works are very much complementary.

Although I guess that most readers will treat HS primarily as a reference work, my reading was systematically from

cover to cover. Its strict ordering by date of birth here proved more workable than the rather arbitrary thematic plus alphabetical name order of JK. (AC has strict alphabetical order, and biographical articles form just one of many categories.) There is considerable variation among contributors in style, all the way from reverent hagiography to affectionate anecdote. Some local heroes seem a bit overdone, but all deserve inclusion. Among the highlights are an excellent, well-balanced profile of Fisher and a vivid portrait of William Playfair, 'engineer, political economist and scoundrel' (p. 105), as well as pioneer in statistical graphics. The less valuable contributions include the entry on Bayes, which is largely yet another hyper-condensed history of Bayesian ideas to the present day. Pictures of almost everybody and generally very good short bibliographies help make this work both intriguing and valuable. More disappointingly, HS surely and sorely needed a much stronger copy edit. There are many small errors (most fairly trivial, but some substantive), two different referencing systems, numerous awkward sentences, and too much randomness in punctuation. My pencilled annotations run into the hundreds. An enterprise of this kind deserves a much cleaner second printing.

REFERENCES

- Armitage, P. and Colton, T., eds. (1998). *Encyclopedia of Biostatistics*. Chichester: John Wiley.
 Johnson, N. L. and Kotz, S., eds. (1997). *Leading Personalities in Statistical Sciences: From the Seventeenth Century to the Present*. New York: John Wiley.

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LAWSON, A. B. *Statistical Methods in Spatial Epidemiology*. Wiley, Chichester, 2001. x + 277 pp. £55.00/\$89.95. ISBN 0-471-97572-9.

Public, government, and media concern about health and the environment looks set to ensure a continuing growth of interest in spatial epidemiology. Hitherto, the most valuable reviews of recent associated developments in statistical methodology have been edited collections of multi-authored contributions (e.g., *Spatial Epidemiology*, P. Elliott, J. Wakefield, N. Best, D. Briggs (eds.), OUP, 2000; *Mapping and Risk Assessment for Public Health*, A. Lawson, A. Biggeri, D. Böhning, E. Lesaffre, J.-F. Viel, R. Bertollini (eds.), Wiley, 1999). An overview from a single perspective, with a correspondingly greater potential for comprehensive and integrated reflection on the field, is therefore welcome. This is particularly the case when the book concerned comes from Andrew Lawson, who has made many important personal research contributions to the subject, notably in the modelling of spatial and spatio-temporal clustering of disease. This book, in contrast to his recent and more elementary introduction to disease mapping (*Introductory Guide to Disease Mapping*, A. Lawson and F. Williams, Wiley, 2001), aims to be a 'comprehensive review of recent research' directed primarily at those with a 'strong background in statistics', and from the outset one should say that both of these aims are reflected in the style and the content.