BOOK REVIEW

Mathematical and Statistical Methods for Genetic Analysis (2nd ed)

Kenneth Lange
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Reviewed by C Cannings

This is an enlargement of the first edition under the same title, published in 1997, and about 100 pages longer. There are new chapters on DNA sequence analysis and diffusion processes, plus an appendix on the multivariate normal distribution. Other chapters have been substantially expanded and updated to reflect the rapid expansion of the field. Specifically, there are new sections on binding domain identification, Bayesian estimation of haplotype frequencies, case–control association studies, the gamete competition model, QTL mapping and factor analysis, the Lander–Green–Kruglyac algorithm and its applications, codon and rate variation models, and '..a better discussion..' of statistical significance in DNA sequence matches.

This is an excellent book written in the same crisp and clear style as the first edition. It has enough detail of the underpinning genetics to allow the mathematician and statistician to gain an understanding sufficient to see the challenge and richness of the area. On the other hand, there are always, I believe, enough descriptions and examples to make much of the material informative also to the non-mathematician. It is both a useful reference source and a suitable introduction to the area; indeed, it was only when I was preparing this review that I realised I had two copies of the first edition, one at home and one at work. Clearly, I could not manage for long without the first edition and expect the second edition to prove as valuable.

Are there any criticisms of this volume? There are, of course, topics which I would have liked to have seen included, the coalescent, homozygosity mapping, or expanded, founder effects, but inevitably choices have had to be made. This is a book I am happy to recommend highly, and I look forward to the third edition in a few years time.

C Cannings
Academic Unit of Mathematical Modelling and Genetic Epidemiology, Division of Genomic Medicine, Royal Hallamshire Hospital, University of Sheffield, Sheffield S10 2JF, UK
E-mail: c.cannings@sheffield.ac.uk