

NEW BOOKS

Mixed Models - Theory and Applications. By Eugene Demidenko, Wiley-Interscience, 2004, xviii+704 pp., \$94.95

This is a volume in the Wiley Series in Probability and Statistics. In the first ten chapters, the author discusses statistical models when the data come in traditional form as a sequence of numbers. However, chapter 11 deals with a sample (ensemble) of shapes and chapter 12 with the analysis of ensembles of images. This reflects the emphasis of the book on the statistical analysis of *samples of samples*: the statistician may have to analyze repeated measurements with thousands of clusters, and data may come in the form of shapes and images. The book takes the model-based approach to analyze data, and statistical treatment is carried out under a unifying mixed effects approach, an approach which becomes useful in analyzing complex clustered data (a sample of samples) and also as a statistical model for penalization and a common ground for the Bayesian and frequentist camps. The book is divided into three parts. The first eight chapters cover the theory of mixed models: the linear mixed effects (LME) model, the generalized linear mixed model (GLMM), and the nonlinear mixed effects (NLME) model. Chapter 9 discusses methods of model diagnostics and inferential analysis. The last three chapters are devoted to applications: tumor regrowth, shape, and image. There is a book web site with additional information, including data and images. Chapter headings: 1. Introduction: why mixed models? 2. MLE for LME models; 3. Statistical properties of the LME model; 4. Growth curve model and generalizations; 5. Meta-analysis models; 6. Nonlinear marginal model; 7. GLMM's; 8. NLME model; 9. Diagnostic and influence analysis; 10. Tumor regrowth curves; 11. Statistical analysis of shape; 12. Statistical image analysis. 13. Appendix: useful facts and formulas. There is a bibliography of over 500 entries.

Generalized Latent Variable Modeling - Multilevel, Longitudinal and Structural Equation Models. By Anders Skrondal and Sophia Rabe-Hesketh, Chapman & Hall/CRC, 2004, x+508 pp.

This is a volume in the series Interdisciplinary Statistics. A major aim of this book is to unify and extend latent variable modeling in the widest sense, by covering not only multilevel, longitudinal and structural equation models, but also generalized linear mixed, random coefficient, item response, factor, panel, repeated measurement, latent class, and frailty models. It attempts to synthesize approaches from different disciplines and to translate between the languages of statistics, biometrics, psychometrics and econometrics. The 14 chapters are divided into two parts, methodology (chapters 1 - 8) and applications (chapters 9 - 14). Chapter 1 discusses the concept, uses and interpretations of latent variables. Chapter 2 brings together models for different response types used in different disciplines. Chapter 3 reviews classical latent variable models, and chapter 4 unifies and extends these for all response types surveyed in chapter 2. Established and novel methods for model identification, estimation, latent variable prediction, and model diagnostics are extensively covered in chapters 5 to 8. Chapters 9 to 14 use the methodology developed in the first part to address problems from biology, medicine, psychology, education, sociology, political science, economics, marketing, and other areas.