



Extending the Linear Model with R: Generalized Linear, Mixed Effects and Nonparametric Regression Models, Second Edition (Chapman & Hall/CRC Texts in Statistical Science)

By Julian J. Faraway

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Start Analyzing a Wide Range of Problems

Since the publication of the bestselling, highly recommended first edition, R has considerably expanded both in popularity and in the number of packages available. **Extending the Linear Model with R: Generalized Linear, Mixed Effects and Nonparametric Regression Models, Second Edition** takes advantage of the greater functionality now available in R and substantially revises and adds several topics.

New to the Second Edition

- Expanded coverage of binary and binomial responses, including proportion responses, quasibinomial and beta regression, and applied considerations regarding these models
- New sections on Poisson models with dispersion, zero inflated count models, linear discriminant analysis, and sandwich and robust estimation for generalized linear models (GLMs)
- Revised chapters on random effects and repeated measures that reflect changes in the lme4 package and show how to perform hypothesis testing for the models using other methods
- New chapter on the Bayesian analysis of mixed effect models that illustrates the use of STAN and presents the approximation method of INLA
- Revised chapter on generalized linear mixed models to reflect the much richer choice of fitting software now available
- Updated coverage of splines and confidence bands in the chapter on nonparametric regression
- New material on random forests for regression and classification

- Revamped R code throughout, particularly the many plots using the ggplot2 package
- Revised and expanded exercises with solutions now included

Demonstrates the Interplay of Theory and Practice

This textbook continues to cover a range of techniques that grow from the linear regression model. It presents three extensions to the linear framework: GLMs, mixed effect models, and nonparametric regression models. The book explains data analysis using real examples and includes all the R commands necessary to reproduce the analyses.



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Editorial Review

Review

Praise for the First Edition:

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?*Computational Statistics*, April 2009, Vol. 24

"The text is well organized and carefully written ... provides an overview of many modern statistical methodologies and their applications to real data using software. This makes it a useful text for practitioners and graduate students alike."

?*Journal of the American Statistical Association*, December 2007, Vol. 102, No. 480

"I enjoyed this text as much as [Faraway's *Linear Models with R*]. The book is recommended as a textbook for a computational statistical and data mining course including GLMs and non-parametric regression, and will also be of great value to the applied statistician whose statistical programming environment of choice is R."

?*Journal of Applied Statistics*, July 2007, Vol. 34, No. 5

"This is a very pleasant book to read. It clearly demonstrates the different methods available and in which situations each one applies. It covers almost all of the standard topics beyond linear models that a graduate student in statistics should know. It also includes discussion of topics such as model diagnostics, rarely addressed in books of this type. The presentation incorporates an abundance of well-chosen examples ... this book is highly recommended ..."

?*Biometrics*, December 2006

About the Author

Julian J. Faraway is a professor of statistics in the Department of Mathematical Sciences at the University of Bath. His research focuses on the analysis of functional and shape data with particular application to the modeling of human motion. He earned a PhD in statistics from the University of California, Berkeley.

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