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EXTENDING THE LINEAR MODEL WITH R

Generalized Linear, Mixed Effects and Nonparametric Regression Models

Julian J. Faraway

University of Michigan, Ann Arbor, USA

A volume in the *Texts in Statistical Science* Series • Series Editors: Chris Chatfield, Martin Tanner, and Jim Zidek

The tools and techniques of three major extensions

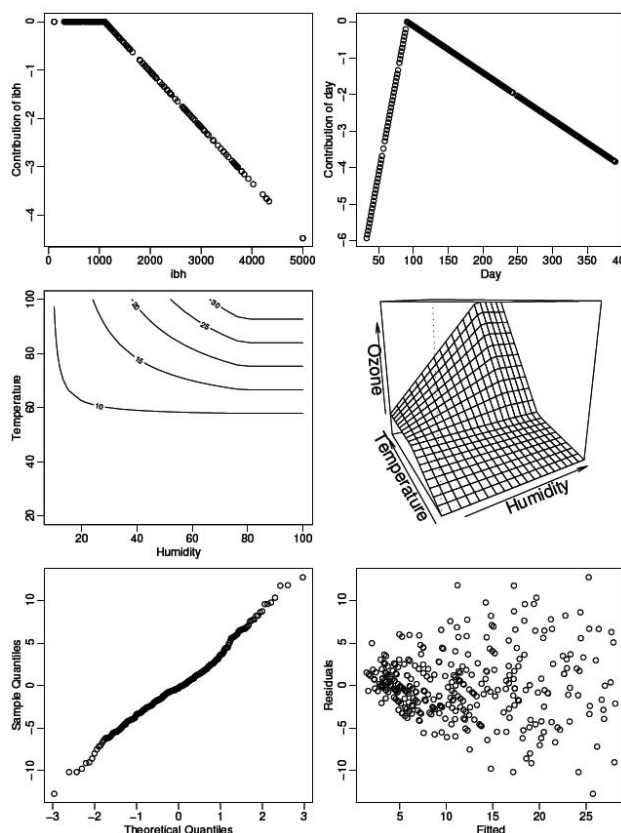
Linear models are central to the practice of statistics and form the foundation of a vast range of statistical methodologies. Julian J. Faraway's critically acclaimed *Linear Models with R* examined regression and analysis of variance, demonstrated the different methods available, and showed in which situations each one applies.

Continuing on that path, **Extending the Linear Model with R** surveys the techniques that grow from the regression model, presenting three extensions to that framework: generalized linear models (GLMs), mixed effect models, and nonparametric regression models. The author's treatment is thoroughly modern and covers topics that include GLM diagnostics, generalized linear mixed models, trees, and even the use of neural networks in statistics. To demonstrate the interplay of theory and practice, throughout the book the author weaves the use of the R software environment to analyze the data of real examples, providing all of the R commands necessary to reproduce the analyses. A supporting Web site at www.stat.lsa.umich.edu/~jfaraway/ELM holds all of the data described in the book.

Statisticians need to be familiar with a broad range of ideas and techniques. This book provides a well-stocked toolbox of methodologies, and with its unique presentation of these very modern statistical techniques, holds the potential to break new ground in the way graduate-level courses in this area are taught.

Features

- Offers an outstanding practical survey of statistical methods extended from the regression model
- Presents all of the linear model extensions using a common framework, making estimation, inference, and model building and checking clearly understandable
- Includes an introductory chapter that reviews the linear model and the basics of using R
- Provides a companion Web site featuring all of the datasets used in the book



Contributions of predictors in the MARS model and diagnostics

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