Mixed Effects Models

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Statistical Modeling in R
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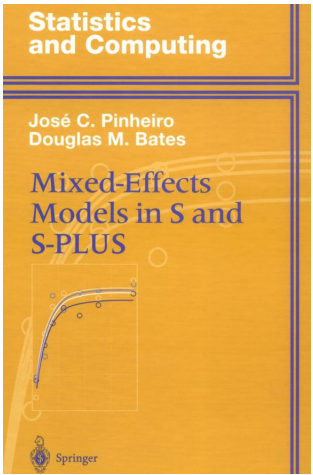
Pinheiro and Bates 2000



Linear mixed effects

Analysis of covariance (pp. 30–41)

LM $\quad y_{ij} = \beta_{0i} + \beta_1 x_{ij} + \epsilon_{ij} \qquad \epsilon_{ij} \sim N(0, \sigma^2)$

LME $\quad y_{ij} = \beta_0 + b_i + \beta_1 x_{ij} + \epsilon_{ij} \qquad b_i \sim N(0, \sigma_b^2)$

$\epsilon_{ij} \sim N(0, \sigma^2)$

Nonlinear mixed effects

Logistic growth model (pp. 338–350 and 354–362)

$$y_{ij} = \frac{\phi_1 + b_i}{1 + \exp[-(t_{ij} - \phi_2)/\phi_3]} + \varepsilon_{ij}$$

Generalized linear mixed effects

Poisson, negative binomial, zero inflation, etc.

Paper

`https://doi.org/10.32614/RJ-2017-066`

Package

`https://cran.r-project.org/package=glmmTMB`