Richly Parameterized Linear Models

Hodges (2014). Richly Parameterized Linear Models: Additive, Time Series, and Spatial Models Using Random Effects.

1 An Opinionated Survey of Methods for Mixed Linear Models

The general notation of mixed linear models is $y = X\beta + Zu + \epsilon$, where the observation y is explained through a design matrix X connected to fixed effects β, a design matrix Z connected to normal random effects u, and a normally distributed error ϵ. The covariance matrix of the random effects u is a function of unknowns ϕ_G. "All of the oddities and inconveniences examined in this book arises because ϕ_G is unknown."

Old-style versus new-style random effects.