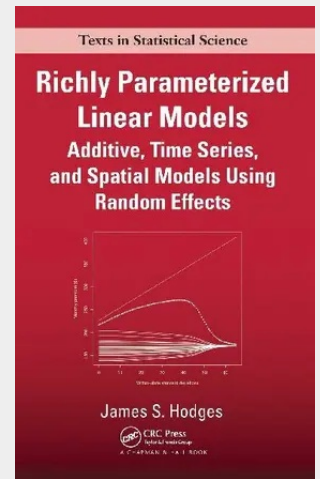


Hodges

Richly Parameterized Linear Models

Additive, Time Series, and Spatial Models Using Random Effects

A First Step toward a Unified Theory of Richly Parameterized Linear Models Using mixed linear models to analyze data often leads to results that are mysterious, inconvenient, or wrong. Further compounding the problem, statisticians lack a cohesive resource to acquire a systematic, theory-based understanding of models with random effects. Richly Parameterized Linear Models: Additive, Time Series, and Spatial Models Using Random Effects takes a first step in developing a full theory of richly parameterized models, which would allow statisticians to better understand their analysis results. The author examines what is known and unknown about mixed linear models and identifies research opportunities. The first two parts of the book cover an existing syntax for unifying models with random effects. The text explains how richly parameterized models can be expressed as mixed linear models and analyzed using conventional and Bayesian methods. In the last two parts, the author discusses oddities that can arise when analyzing data using these models. He presents ways to detect problems and, when possible, shows how to mitigate or avoid them. The book adapts ideas from linear model theory and then goes beyond that theory by examining the information in the data about the mixed linear model's covariance matrices. Each chapter ends with two sets of exercises. Conventional problems encourage readers to practice with the algebraic methods and open questions motivate readers to research further. Supporting materials, including datasets for most of the examples analyzed, are available on the author's website.



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