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Title:

Bootstrapping longitudinal data with multiple levels of variation

Abstract:

We consider a set of estimators for model parameters in the framework of linear mixed models for longitudinal data with multiple levels of random variation. Various bootstrap methods are assessed for making inference about the parameters including the variance components for which, typically, bootstrap confidence intervals show undercoverage. We propose a new weighted estimating equation bootstrap, which uses different weight schemes for different parameter estimators. The proposed method shows improved variance estimation for the variance component estimators and produces confidence intervals with better coverage for the variance components in cases with normal and non-normal errors.