Hierarchical Likelihood Methods for Nonlinear and Generalized Linear Mixed Models with Missing Data and Measurement Errors in Covariates

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Nonlinear mixed-effects (NLME) models and generalized linear mixed models (GLMM) are popular in the analysis of longitudinal data and clustered data. Covariates are often introduced to partially explain the large between individual (cluster) variation. Many of these covariates, however, contain missing data and/or are measured with errors [1]. In these cases, likelihood inference can be computationally very challenging since the observed data likelihood involves a high-dimensional and intractable integral. Computationally intensive methods such as Monte-Carlo EM algorithms may offer computational difficulties such as very slow convergence or even non-convergence. In this presentation, we consider hierarchical likelihood Methods [2] which approximate the the observed-data likelihood so completely avoid the intractable integral. We evaluate the methods via simulation and illustrate the methods by two examples.

References

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