Generalized partially linear mixed-effects models incorporating mismeasured covariates

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Abstract   In this article we consider a semiparametric generalized mixed-effects model, and propose combining local linear regression, and penalized quasilikelihood and local quasilikelihood techniques to estimate both population and individual parameters and nonparametric curves. The proposed estimators take into account the local correlation structure of the longitudinal data. We establish normality for the estimators of the parameter and asymptotic expansion for the estimators of the nonparametric part. For practical implementation, we propose an appropriate algorithm. We also consider the measurement error problem in covariates in our model, and suggest a strategy for adjusting the effects of measurement errors. We apply the proposed models and methods to study the relation between virologic and immunologic responses in AIDS clinical trials, in which virologic response is classified into binary variables. A dataset from an AIDS clinical study is analyzed.