HETEROGENEOUS VARIANCES IN NONLINEAR MIXED EFFECTS MODELS VIA THE SAEM-MCMC ALGORITHM

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The SAEM-MCMC algorithm is a powerful tool for computing maximum likelihood estimators in a wide class of nonlinear mixed models. We propose an adaptation of this algorithm to the estimation of heterogeneous variances in such models.

Two residual variance models are considered: a linear mixed model on the log-variance, and a mean-variance relationship.

As compared to other procedures implemented in R, SAS and Monolix, our algorithm provides more flexibility in modelling variance functions and reliability in the outputs.

It was validated with a standard EM algorithm implemented on a linear mixed model using growth data of Pothoff and Roy. Finally, an application to real data involving a selection experiment on growth in chicken is presented in which that algorithm was compared to outputs of SAS-Nlmixed, Nlme, Monolix and WinBUGS softwares.