Variable Screening and Parameter Estimation for High-Dimensional Generalized Linear Mixed Models Using ℓ_1-Penalization

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We propose a two step procedure for dealing with high-dimensional generalized linear mixed models. Generalized linear mixed models (Breslow and Clayton, 1993; Bates, 2009a,b) are straighforward extensions of generalized linear models for clustered observations. In a first step, we perform a Lasso-type (Tibshirani, 1996) variable screening procedure in order to select a relatively small set of covariates. In the second step, we perform ordinary maximum likelihood using only the variables selected in the first step. The latter step is necessary for overcoming bias problems steming from the variable screening step.

In this talk, we present the key ingredients for fitting high-dimensional generalized linear mixed models and demonstrate the performance of the prodecure by presenting the new *R* package **glmmlasso**.

This work is an extension of Schelldorfer et al. (2011) for gaussian linear mixed models and the *R* package **lmmlasso**, which is available from R-Forge (http://lmmlasso.R-forge.R-project.org) and the first author's website (http://stat.ethz.ch/people/schell).

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