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A Julia package for fitting (statistical) mixed-effects models

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Douglas Bates on Mixed Models

The most important aspect of Julia is "one language". You develop in the same language in which you optimize.

The type system in Julia allows me to incorporate the different kinds of penalized least squares solvers in what to me is a clean way, thereby taking advantage of structural simplifications in simple, but common, cases.

It is possible to do this in R/C++/Rcpp/EIgen but it would be a massive headache and perhaps beyond my abilities to do it well.

Statistics with Julia

Douglas Bates on Mixed Models

The numerical methods implemented in lme4 are, in my opinion, superior to those in nlme, mainly through the use of the relative covariance factor and the profiled log-likelihood.

These may seem like details but to me they are very important. The motiviation for incorporating sparse matrix classes in the Matrix package and accessing the CHOLMOD code was to provide a general method for fitting such models.

Using C++, Rcpp and RcppEigen was motivated by trying to provide generality and speed. The end result is confusing (my fault entirely) and fragile.