Regularisation of Generalised Linear Mixed Models with autoregressive random effect

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Abstract: We address regularised versions of the Expectation-Maximisation (EM) algorithm for Generalised Linear Mixed Models (GLMM) in the context of panel data (measured on several individuals at different time-points). A random response y is modelled by a GLMM, using a set X of explanatory variables and two random effects. The first one introduces the dependence within individuals on which data is repeatedly collected while the second one embodies the serially correlated time-specific effect shared by all the individuals. Variables in X are assumed many and redundant, so that regression demands regularisation. In this context, we first propose a L_2-penalised EM algorithm, and then a supervised component-based regularised EM algorithm as an alternative.

Keywords: Regularised EM algorithm; Generalised Linear Mixed Model; Autoregressive random effect; Panel data analysis.