

Local influence analysis for regression models with scale mixtures of skew-normal distributions

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Abstract

The robust estimation and the local influence analysis for linear regression models with scale mixtures of multivariate skew-normal distributions have been developed in this paper. The main virtue of considering the linear regression model under the class of scale mixtures of skew-normal distributions is that they have a nice hierarchical representation which allows an easy implementation of inference. Inspired by the EM algorithm, we have developed a local influence analysis based on the conditional expectation of the complete-data log-likelihood function, which is a measurement invariant under reparametrizations. This is because the observed data log-likelihood function associated with the proposed model is somewhat complex and with Cook's well-known approach it can be very difficult to obtain measures of the local influence. Some useful perturbation schemes are discussed. In order to examine the robust aspect of this flexible class against outlying and influential observations, some simulation studies have also been presented. Finally, a real data set has been analyzed, illustrating the usefulness of the proposed methodology.

Keywords: EM algorithm, Local influence analysis, Scale mixtures of skew-normal distributions.