Sinh-skew-normal/Independent Regression Models

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Abstract: *Skew-normal/independent (SNI) distributions form an attractive class of asymmetric heavy-tailed distributions that also accommodate skewness. We use this class of distributions here to derive a generalization of sinh-normal distributions (Rieck, 1989), called the sinh-skew-normal/independent (sinh-SNI) distribution. Based on this distribution, we then propose a general class of nonlinear regression models, generalizing the regression models of Rieck and Nedelman (1991) that have been used extensively in Birnbaum-Saunders regression models. The proposed regression models have a nice hierarchical representation that facilitates easy implementation of an EM-algorithm for the maximum likelihood estimation of model parameters and provide a robust alternative to estimation of parameters. Simulation studies as well as applications to a real dataset are presented to illustrate the usefulness of the proposed model as well as all the inferential methods developed here.*

Keywords:: Birnbaum-Saunders distribution; EM-algorithm; Robust estimation; Skew-normal/Independent distribution; Sinh-normal distribution.

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