

Scale and shape mixtures of multivariate skew-normal distributions

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Abstract

In this paper we introduce a broad and flexible class of multivariate distributions obtained by both scale and shape mixtures of multivariate skew-normal distributions. We present the probabilistic properties of this family of distributions in detail and lay down the theoretical foundations for subsequent inference with this model. In particular, we study linear transformations, marginal and conditional distributions, stochastic representations, hierarchical representations, selection representations, moments and Mardia's measures of multivariate skewness and kurtosis. We also describe an EM-type algorithm for maximum likelihood estimation of the parameters of the new model. Our family of multivariate distributions unifies many existing models of the literature that can be seen as submodels of our novel proposal.

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