

A Prior Procedure for Estimating the Location Parameter under the Skew Elliptical Setting

Xiangfei Chen, Tonghui Wang, and David Trafimow

Abstract The a priori procedure (APP) provides minimum sample sizes for estimating parameters of the population distribution that ensures precision and confidence in sample statistics. In this paper, we extend the APP to include the family of skew elliptical distributions, which is a member of a broad family of probability distributions and is an extension of the family of skew normal distributions and scale mixture of the skew normal distributions. Properties of the skew elliptical distribution are discussed. Under the vectorized assumption and with a given precision and a confidence level, the desired sample size for estimating the location parameter is obtained for skew t and skew Laplace distribution, respectively. The confidence interval for the location parameter is constructed based on the desired sample size using skew elliptical distribution. A real data example is given to illustrate our main results. In addition, the Shinyapp program links some of the skew elliptical distributions provided for researchers and practitioners to use. In the program, the desired sample size and adjusted precisions are calculated.