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An Interesting Application of a Likelihood-Based Asymptotic Method

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Abstract

Fraser (1990) discussed how to obtain statistical inference for a scalar parameter of interest from the likelihood function. Since then many authors have extended the method and applied it to various models. In this paper we consider the one-sample normal problem. Using the likelihood-based asymptotic method described in Fraser (1990), we obtain the p-value function for the mean parameter as well as the variance parameter. By re-expressing the results, we derive simple and accurate normal approximations to the Student t- and χ^2- cumulative distribution functions.

Keywords: Canonical parameter, exponential family model, modified signed log-likelihood ratio statistic, p-value function.

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