Exact statistical inferences and Monte Carlo method

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Abstract

© 2014, Pleiades Publishing, Ltd. It is shown that in some situations, for example, models invariant under certain groups of transformations, search constants determining statistical inference can be organized by random simulation while maintaining the nominal level of reliability. It is established that the accuracy of statistical inference varies depending on the number of replications M of the Monte Carlo method of the order M−1. Some examples (confidence intervals for the center of the Cauchy distribution, upper bound for scale Laplace parameter, discrimination between the normal and Cauchy distributions, discrimination between exponential and log-normal distributions) show that an acceptable accuracy of statistical inference is achieved when the number of Monte Carlo replications M >100.

Keywords

confidence regions, Exact statistical inference, hypothesis testing, method Monte Carlo