

# Interval Estimation Procedures and Information Inequalities

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In the case when a parameter is assumed to be nonnegative or positive valued, a combined Bayesian-frequentist approach to confidence intervals is adopted, and its comparison with ordinary and Bayesian confidence intervals are done in normal cases. In the interval estimation problem on the difference between two means in exponential and normal cases, a systematic method of the construction of a confidence interval is obtained, and its application to the Behrens-Fisher type problem is given. Next, we consider a family of distributions for which the second order Bhattacharyya bound becomes sharp, and a necessary and sufficient condition for the second order one to be sharp is given for a family of linear combinations of distributions which belong to the exponential family. From the Bayesian viewpoint, we construct an estimator which minimizes locally the variance of any estimator satisfying weaker conditions than the unbiasedness from which an information inequality is derived.

Key Words: Confidence intervals, Combined Bayesian-frequentist approach, Behrens-Fisher type problem, Bhattacharyya bound