On Construction of the Smallest One-sided Confidence Intervals

by

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Abstract

The smallest confidence interval for a given class of intervals is defined to be the intersection of all intervals in the class. If it belongs to the given class, we say the smallest interval exists in that class, and this interval is simply the best in the class. In this talk, we present a construction of the smallest one-sided $1 - \alpha$ intervals in two cases: i) when there is a single parameter, ii) when there exist nuisance parameters, with a certain order on the confidence limits. As an example, we show the construction using binomial distributions. In particular, we provide the smallest one-sided $1 - \alpha$ intervals for a single proportion p and the difference of two independent proportions $p_1 - p_2$. Both have important applications in statistical practice.