A rigorous lower confidence bound for the expectation of a positive random variable

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Abstract

Given an IID sample from a positive distribution, we provide a method for constructing rigorous finite sample lower confidence bounds for the expectation of the distribution. The method is based on constructing rigorous confidence regions for the cdf of the distribution. We provide some analysis of the asymptotical behavior of the rigorous LCBs. We apply the method to obtain an LCB for a particular, controversial, empirical data set, where the validity of standard methods has been called into question.

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