

Research

A New Method for Constructing Confidence Intervals for the Index C_{pm}

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In the statistical literature on the study of the capability of processes through the use of indices, C_{pm} appears to have been one of the most widely used capability indices and its estimation has attracted much interest. In this article, a new method for constructing approximate confidence intervals or lower confidence limits for this index is suggested. The method is based on an approximation of the non-central chi-square distribution, which was proposed by Pearson. Its coverage appears to be more satisfactory compared with that achieved by any of the two most widely used methods that were proposed by Boyles, in situations where one is interested in assessing a lower confidence limit for C_{pm} . This is supported by the results of an extensive simulation study. Copyright © 2004 John Wiley & Sons, Ltd.

KEY WORDS: process capability indices; non-central chi-square distribution; approximate confidence intervals; lower confidence limits; simulation study