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One-sided Shewhart-EWMA and Shewhart-CUSUM Charts for Monitoring a Shifted Exponential Process

In this work we consider one-sided EWMA and CUSUM charts with one Shewhart-type control limit, and study their performance in the detection of shifts, of different magnitude, in the parameters of a two-parameter exponential distribution. Using Monte Carlo simulation, we calculate the run length distribution of the considered charts and evaluate their performance, focusing on the average run length and the expected average run length. Furthermore, we provide empirical rules for their statistical design. The preliminary results show that the considered combined schemes have better performance than the usual EWMA and CUSUM charts, especially in the detection of decreasing shifts in process parameters. An illustrative example, based on real data, is also discussed.

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Special/ Invited session

Classification

Mainly methodology

Keywords

Combined control charts, Monte Carlo simulation, Run length distribution

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