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Omnibus Control Charts for Poisson Counts

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Existing control charts for Poisson counts are tailor-made for detecting changes in the process mean while the Poisson assumption is not violated. But if the mean changes together with the distribution family, the performance of these charts may deviate considerably from the expected out-of-control behavior. In this research, omnibus control charts for Poisson counts are developed, which are sensitive to a broad variety of process changes. This is achieved by adapting common omnibus goodness-of-fit (GoF) tests to process monitoring. More precisely, different GoF-tests based on the probability generating function (pgf) are combined with an exponentially weighted moving-average (EWMA) approach in various ways. A comprehensive simulation study leads to clear design recommendations on how to achieve the desired omnibus property. The practical benefits of the proposed omnibus EWMA charts are demonstrated with several real-world data examples.

Type of presentation

Talk

Classification

Both methodology and application

Keywords

attributes data; EWMA charts; goodness-of-fit tests; Poisson distribution; probability generating function

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