Preliminary results on new control charts for inflated binomial processes

***A. Arques-Colomina*[1], *M. C. Belmonte-Bueso*[1], *V. Giner-Bosch*[2], *P. Castagliola*[3]**

[1]Department of Applied Statistics, Operational Research and Quality, Universitat Politècnica de València, Spain
[2]Centre for Quality and Change Management, Universitat Politècnica de València, Spain
[3]Nantes Université LS2N UMR CNRS 6004, France

In this talk, we present some new monitoring schemes for inflated binomial processes. More precisely, a control chart for a quality characteristic following a zero-inflated binomial (ZIB) distribution is developed based on a discrete version of the EWMA strategy called CEWMA (for count EWMA; Rakitzis et al., 2015 [1]). A procedure for optimally determining the chart parameters is devised and implemented, the performance of the chart being evaluated through an exact calculation of the ARL via Markov chain methods.

Additionally, we present an extension of the ZIB model called the geometrically-inflated binomial (GIB) distribution, which is defined similarly to its Poisson counterpart (Rakitzis et al., 2016 [2]), and we explore some control charts for a process following this distribution. Specifically, a traditional Shewhart-like scheme and some run-rule strategies are developed and studied, focusing on optimal performance.

Preliminary results on the performance of these new charts are presented, as well as a study on how they compare against their competitors.

Keywords: Zero-inflated binomial distributions, High-yield processes, discrete EWMA, Run rules, Markov chains

References

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