



Contribution ID: 110

Type: **not specified**

Monitoring proportions with two components of common cause variation

Tuesday, June 28, 2022 10:30 AM (20 minutes)

The basic available control charts for attributes are based on either the binomial or the Poisson distribution (p-chart and u-chart) with the assumption of a constant in-control parameter for the mean. The corresponding classical control limits are then determined by the expected sampling variation only. If common cause variability is present between subgroups, these control limits could be very misleading. This issue is more relevant when sample sizes are large, because then the sampling variation diminishes and the control limits move towards the center line, resulting in misleading out-of-control signals.

We propose a method for monitoring proportions when the in-control proportion and the sample sizes vary over time and when both inter- and intra-subgroup variation is present. Our approach is able to overcome some of the performance issues of other commonly used methods, as we demonstrate using analytical and numerical methods. The results are shown mainly for monitoring proportions, but we show how the method can be extended to the monitoring of count data.

Keywords

attribute charts, overdispersion, parameter estimation

Primary author: GOEDHART, Rob (University of Amsterdam)

Co-author: Prof. WOODALL, William (Virginia Tech)

Presenter: GOEDHART, Rob (University of Amsterdam)

Session Classification: CONTRIBUTED Modelling 3

Track Classification: Modelling