A Synthetic Control Chart Reexpression Vector Variance for Process Multivariate Dispersion

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Abstract

A control charts Reexpression Vector Variance (RVV) can be used to monitoring the dispersion of multivariate process as an alternative to the control charts Generalized Variance (GV) is commonly used. The synthetic control chart RVV is built in a combination the standard control charts RVV (Shewhart class control chart) with the control chart of conforming run length (CRL). Average run length of the synthetic control charts VV be compared with the standard control charts VV, the standard control charts GV and the synthetic control charts GV. The result, the synthetic control chart RVV superior than standard GV chart, synthetic GV chart, and standard RVV chart to all of the condition change of the covariance matrix.

Keywords: Multivariate dispersion, vector variance, conforming run length, average run length.

1. Introduction

In the field of manufacturing industry, monitoring in a process of becoming an inevitability. This activity is done to continuous quality improvement. There are two phase in monitoring the process. Phase I consisting of the use of a control chart for (i) stage 1 'start-up stage' in retrospective testing what 's the process in control when subgrup-sugrup first drawn; and (ii) stage 2, 'future control stage' which is testing whether the process remain in control when subgroup-subgrup future taken. In the multivariate characteristic, standard value with regard to the mean vector μ_0 and a covariance matrix Σ_0 (Alt and Bedewi, 1986).