

A Multivariate Non Parametric Monitoring Procedure Based on Convex Hulls

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Abstract:

Woodall and Montgomery (1999) stated that Multivariate Statistical Process Monitoring (MSPM) is one of the most rapidly developing areas of statistical process control. Bersimis et al. (2007) motivated by Woodall and Montgomery (1999) statement published an extensive review paper of the field of MSPM. According to Bersimis et al. (2007) open problems in the field of MSPM, among others are robust design of monitoring procedures and non-parametric control charts. In this work, we introduce a non-parametric control scheme based on convex hulls. The proposed non-parametric control chart is using bootstrap for estimating the kernel of the multivariate distribution and then appropriate statistics based on convex hull are monitored. The performance of the proposed control chart is very promising.

Keywords:

Statistical Process Monitoring; Multivariate Statistical Process Monitoring; Convex Hulls; Bootstrapping;

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