

A Nonparametric Control Chart Based On The Mann Whitney

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A Nonparametric Control Chart Based

A non parametric CUSUM control chart based on the Mann-Whitney statistic. ABSTRACT We consider a novel univariate non parametric cumulative sum (CUSUM) control chart for detecting the small shifts in the mean of a process, where the nominal value of the mean is unknown but some historical data are available. This chart is established based on the Mann-Whitney statistic as well as the change-point model, where any assumption for the underlying distribution of the process is not required.

[PDF] A non parametric CUSUM control chart based on the ...

A key advantage of nonparametric charts is that the in-control run length distribution is the same for all continuous process distributions. Nonparametric charts are more robust and efficient than...

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(PDF) Control Charts, Nonparametric - ResearchGate

This chart is established based on the Mann-Whitney statistic as well as the change-point model, where any assumption for the underlying distribution of the process is not required. The performance comparisons based on simulations show that the proposed control chart is slightly more effective than some other related non parametric control ...

A non parametric CUSUM control chart based on the Mann ...

To this end, nonparametric or distribution-free control charts have been proposed in recent years. The charts have stable in-control properties, are robust against outliers and can be surprisingly efficient in comparison with their parametric counterparts.

Nonparametric (distribution-free) control charts: An ...

Abstract Traditional control charts like Hotelling (T^2) are based on the assumption of multivariate normality and also inapplicable to high-dimensional data. A notion of data depth has been used to measure centrality of a given point in a given data cloud.

Nonparametric Control Charts Based on Data Depth for ...

In this paper, we propose a new nonparametric control chart (called the kLINK chart) based on a k-linkage ranking algorithm that calculates the ranking of a new observation relative to the in-control training data.

Nonparametric multivariate control charts based on a ...

For example, Bakir (2006) has constructed a Shewhart-type control chart using a signed-rank statistic, Chakraborti and Eryilmaz (2007) have considered an alternative class of charts based on the same statistic, while Albers et al. (2006) have used a suitably modified version of a nonparametric control chart; for an overview of distribution-free control charts for continuous variables, interested readers are referred to Chakraborti et al. (2001).

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Nonparametric control charts based on runs and Wilcoxon ...

Then, three non parametric PROS control charts are proposed including the classic 3-sigma control chart, a non parametric bootstrap approach-based control chart, and a hybrid control chart based ...

(PDF) Nonparametric Control Charts: An Overview and Some ...

EWMA control chart based on the Sukhatme statistic is denoted by EWMA-S. 3.2 CUSUM CONTROL CHART Similar to [7], the one-sided CUSUM control chart based on non-parametric statistic T is defined as: $S \text{ Max } S T k t t t (0,) 1$, where $S 0 =0$, $h>0$ and $k>0$. Parameter k is a reference value and k is a control limit. Hence, $W t$ is observation based on

Sensitive Non-Parametric Control Charts For Monitoring

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In addition, the proposed control chart based on ranks of data is a nonparametric method without assuming normal or Poisson distribution for the data. To investigate the performance of the proposed...

Multivariate nonparametric chart for influenza epidemic

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Nonparametric or distribution-free charts can be useful in statistical process control problems when there is limited or lack of knowledge about the underlying process distribution. In this paper, a phase II Shewhart-type chart is considered for location, based on reference data from phase I analysis and the well-known Mann-Whitney statistic.

Chakraborti, van de Wiel: A nonparametric control chart

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A new nonparametric EWMA Sign Control Chart 1. Introduction. Control charts are commonly used tools to improve the quality of a process/service; like the \bar{X} -bar, R ,... 2. The EWMA Sign Chart. Assume that a critical quality characteristic, X , has a target value T . Let $Y = X - T$ and $p = P...$ 3. ...

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A new nonparametric EWMA Sign Control Chart - ScienceDirect

Based on the performed simulations and subsequent verification of the methodology on real data, it was found that nonparametric control charts are a suitable alternative to the standard Shewhart control charts in cases where the basic assumptions about the data are not met.

Methodology for the Application of Nonparametric Control ...

Multivariate Nonparametric Control Chart With Storage Space. Abstract: Currently, it is important to monitor multivariate data in a timely manner. The spatial-rank-based multivariate exponentially weighted moving average control chart (SREWMA) has better relative performance for multivariate data monitoring when the underlying distribution is non-normal.

Multivariate Nonparametric Control Chart With Storage ...

Amin, R.W., and Reynolds, M.R., Jr., 1996, "Nonparametric Quality Control Charts Based on the Sign Statistic," Communications in Statistic. Part A: Theory and Methods, 24(6), 1597-1623. 8. Johnson, D.E., 1998, Applied Multivariate Methods for Data Analysts, Duxbury Press, Pacific Grove.

A Non-Parametric Control Chart for Multivariate Processes ...

Distribution-free control chart. Distribution-free (nonparametric) control charts are one of the most important tools of statistical process monitoring and control. Implementation techniques of distribution-free control charts do not require any knowledge about the underlying process distribution or its parameters.

Distribution-free control chart - Wikipedia

In this paper, we develop a nonparametric tool based on the change-point model for statistical process control. This method is shown to perform well, even beating the parametric approach for small to moderate shifts in normal data, and to involve relatively light computation. KW - Chart performance.

A nonparametric change-point control chart —

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A New Multivariate Non-Parametric Control Chart Based on Sign Test. AbstractMultivariate statistical process control deserves particular attention in the recent scenario. Though, Hotelling T2 control chart is quite popular and widely used technique in this field but its performance is deteriorated when the underlying distribution of the quality characteristics is not following multivariate normal distribution.

A New Multivariate Non-Parametric Control Chart Based on ...

The framework for constructing nonparametric control charts based on order statistics calls for the following step-by-step procedure. Step 1. Draw a reference sample of size m , namely, X_1, X_2, \dots, X_m , from the process when it is known to be in-control. Step 2.

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