國 立 中 央 大 學

統 計 研 究 所

學 術 演 講

主 講 人：黃榮臣 教授（國立清華大學）

講　　題：**A spatial rank-based EWMA chart for monitoring linear Profiles**

時　　間：**107年11月27日（星期二）** **上午11：00 ～ 12：00**

地　　點：中央大學鴻經館**M429**室

茶　　會：**上午 10：30 ～ 11：00**　　地　點：鴻經館 **510** 室

ABSTRACT

Profile monitoring has been recently considered as one of the most promising areas ofresearch in statistical process monitoring (SPM). It is a technique for monitoring thestability of a functional relationship between a dependent variable and one or moreindependent variables over time. The monitoring of linear Profiles is the most popu-lar one because the relationship between the dependent variable and the independentvariables is easy to describe by linearity, in addition to its exibility and simplicity.Furthermore, almost all existing charting schemes for monitoring linear Profiles as-sume that error terms are normally distributed. In some applications, however, thenormality assumption of error terms is not justied. This makes the existing chartingschemes not only inappropriate but also less efficient for monitoring linear Profiles. Inthis article, based on the spatial rank-based regression, we propose a charting methodfor monitoring linear Profiles where the error terms are not normally distributed. Thecharting scheme applies the exponentially weighted moving average (EWMA) to thespatial rank of the vector of the Wilcoxon-type rank-based estimators of regressioncoefficients and a transformed error variance estimator. Performance properties of the proposed charting scheme are evaluated and compared with an existing chartingmethod based on multivariate sign in terms of the in-control (IC) and out-of-control(OC) average run length (ARL). Finally, a real example is used to demonstrate theapplicability and implementation of the proposed charting scheme.

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