Sensitivity Analysis of Nongaussianity by Projection Pursuit

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Abstract

From the information-theoretic point of view, the Gaussian distribution is the least structured. Therefore, the most non-Gaussian direction in which to explore the clustering structure of data is considered to be the most interesting projection direction when applying projection pursuit. Non-Gaussianity is often measured by kurtosis. However, kurtosis is well-known to be sensitive to influential points/outliers and so the projection direction can be unduly affected by abnormal points. In this paper, we focus on developing influence functions of projection directions in order to detect abnormal observations, especially on high-dimensional data. For multivariate data, a new technique is proposed for defining and developing influence functions of projection directions. In addition, a new influence function is suggested. Two simulated data examples and one concrete data example are provided for illustration.

Keywords: Inuence Function, Kurtosis, Non-Gaussianity, Projection Pursuit.