ON USING INFLUENCE FUNCTIONS FOR TESTING MULTIVARIATE NORMALITY

TAKAFUMI ISOGAI

College of General Education, Osaka University, Toyonaka, Osaka 560, Japan

Abstract. Changes in the joint distribution of influence functions for the mean vector and the covariance matrix are examined when the true probability distribution is contaminated. In particular, the formulas for influence functions of the first and second moments with respect to the above joint distribution are obtained and used to derive reasonable test statistics for multivariate normality. The formulas are extended by using the joint distribution of score functions for population parameters. An application of the extended formulas to the usual linear regression analysis leads to a measure of multivariate skewness which can be used to reduce the effect of non-normality of the response variable. Also, some relationship between the extended formulas and goodness-of-fit statistics is discussed and used to derive test statistics for multivariate normality.

Key words and phrases: Influence function, multivariate normality, measure of dependence, measures of multivariate skewness and kurtosis, score function, linear regression.