Robust multivariate least angle regression

ABSTRACT

The least angle regression selection (LARS) algorithms that use the classical sample means, variances, and correlations between the original variables are very sensitive to the presence of outliers and other contamination. To remedy this problem, a simple modification of this algorithm is to replace the non-robust estimates with their robust counterparts. Khan, Van Aelst, and Zamar employed the robust correlation for winsorized data based on adjusted winsorization correlation as a robust bivariate correlation approach for plug-in LARS. However, the robust least angle regression selection has some drawbacks in the presence of multivariate outliers. We propose to incorporate the Olive and Hawkins reweighted and fast consistent high breakdown estimator into the robust plug-in LARS method based on correlations. Our proposed method is tested by using a numerical example and a simulation study.