

Convex Hull Peeling: Nonparametric Multivariate Analysis Tools

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Abstract

An ad hoc device on multidimensional massive data is in demand. However, multivariate data analysis tools not imposing multivariate normal distribution exist rarely. We introduce convex hull peeling algorithms as a such device for the analysis of multidimensional massive data. Only the convexity of data sets is assumed. These convex hull peeling algorithms are designed to estimate quantiles, detect outliers, and measure distribution shapes of multidimensional data. Additionally, the algorithms are exemplified with Monte Carlo simulations and SDSS DR4 Quasars.