Extension of Tukey's smoothing techniques

ABSTRACT

Tukey introduced a resistant smoothing technique which uses running medians but there is a lack of mathematics generalization. Tukey used examples and exhibited an approach in the statistics field called exploratory data analysis. The proposed technique is hereby presented in mathematical equation form and named symmetric running medians. Subsequently, the symmetric running median technique is extended into the right running median technique. A comparison of the symmetric and the right running medians are made by box plot and contour plot. A generalization of mathematical forms is established for Tukey's smoothing techniques. The extension with the generalization of mathematical forms are shown that they can be applied successfully as a practical smoothing procedure in statistical smoothing field and are also computationally efficient. The methods of smoothing are practically applied to daily Farmer Mac data.

Keyword: Exploratory data analysis; Mathematical generalization; Resistant smoothing; Right running medians; Symmetric running medians