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A jump-preserving curve fitting procedure based on local piecewise-linear kernel estimation.

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Summary: It is known that the fitted regression function based on conventional local smoothing procedures is not statistically consistent at jump positions of the true regression function. In this article, a curve-fitting procedure based on local piecewise-linear kernel estimation is suggested. In a neighborhood of a given point, a piecewise-linear function with a possible jump at the given point is fitted by the weighted least squares procedure with the weights determined by a kernel function. The fitted value of the regression function at this point is then defined by one of the two estimators provided by the two fitted lines (the left and right lines) with the smaller value of the weighted residual sum of squares. It is proved that the fitted curve by this procedure is consistent in the entire design space. In other words, this procedure is jump-preserving. Several numerical examples are presented to evaluate its performance in small-to-moderate sample size cases.

MSC:

[62G08](#) Nonparametric regression and quantile regression

[62G07](#) Density estimation

Cited in **25** Documents

Keywords:

[simulations](#)

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