

Hybrid Robust Estimation via Median Filter and Wavelet Thresholding with Automatic Boundary Correction

Authors : Alsaidi M. Altaher, Mohd Tahir Ismail

Abstract : Wavelet thresholding has been a power tool in curve estimation and data analysis. In the presence of outliers this non parametric estimator can not suppress the outliers involved. This study proposes a new two-stage combined method based on the use of the median filter as primary step before applying wavelet thresholding. After suppressing the outliers in a signal through the median filter, the classical wavelet thresholding is then applied for removing the remaining noise. We use automatic boundary corrections; using a low order polynomial model or local polynomial model as a more realistic rule to correct the bias at the boundary region; instead of using the classical assumptions such periodic or symmetric. A simulation experiment has been conducted to evaluate the numerical performance of the proposed method. Results show strong evidences that the proposed method is extremely effective in terms of correcting the boundary bias and eliminating outlier's sensitivity.

Keywords : boundary correction, median filter, simulation, wavelet thresholding

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