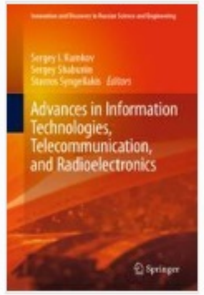

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Many-Factor MIMO-Filters

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Chapter

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Abstract

In the paper, we investigate the effectiveness of modified many-factor (bilateral, tri-, and four-lateral) denoising MIMO-filters for gray, color, and hyperspectral image procession. Conventional bilateral filter performs merely weighted averaging of the local neighborhood pixels. The weight includes two components: spatial and radiometric ones. The first component measures the geometric distances between the center pixel and local neighborhood ones. The second component measures the radiometric distance between the values of the center pixel and local neighborhood ones. Noise affects all pixels even the center one which is used as a reference for the tonal filtering. Thus, the noise affecting the center pixel has a disproportionate effect onto the result. This suggests the first modification: the center pixel is replaced by the weighted average (with some estimate of the true value) of the neighborhood pixels contained in a window around it. The second modification uses the matrix-valued weights. They include four components: spatial, radiometric, interchannel weights, and radiometric interchannel ones. The fourth weight measures the radiometric distance (for gray-level images) between the interchannel values of the center scalar-valued channel pixel and local neighborhood channel ones.

Keywords

Nonlinear filters | Image processing | Generalized aggregation mean

Notes

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