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A structural post-processing method for enhancing intensity restoration of low-density impulse-noise for decision based filters

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**Abstract:** Intensity restoration of pixels corrupted by impulse-noise contributes greatly to the quality of decision based filters (DBF). In this paper, we present an efficient structural post-processing method, which is based on directional-correlation, linear-regression-analysis, and inverse-distance-weighted-mean techniques. The proposed method is adopted as a complementary part after DBFs to enhance the quality of the final restored image. We assume that by adopting the preliminary DBF, noisy-pixels are detected by noise-detection unit and afterwards their intensities are estimated by the noise-restoration unit. In our method for each detected noisy-pixel, the intensity variation of adjacent pixels of restored image on different directions are analyzed in the corresponding local window and based on this structural information, the intensity of the previously-restored noisy-pixel is modified more accurately. Since the structures in images are more recognizable for low-density impulse-noise, our method is more effective in this case however a gradual improvement is achieved for high-density impulse-noise.

**Keywords:** Impulse-noise, Image denoising, Image restoration, Decision based filters, Edge and detail preserving.

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