

MULTIPLE-SCAN SWITCHING MEDIAN FILTER FOR IMPULSE NOISE REDUCTION

SANDIP MEHTA¹ AND JAYASHRI VAJPAI²

¹ Department of Electrical and Electronics Engineering,
JIET SETG, Jodhpur, India.

² Department of Electrical Engineering,
JNV University, Jodhpur, India.

Abstract

This paper presents a novel multiple-scan switching median filter for impulse noise reduction in images. The first stage detects whether the pixel is noisy or not. The noise-free pixel is left unprocessed while the noisy pixel is processed in the next stage by using median filter. If the value of the median is other than the noise levels, then this value of median is retained, else median of the four neighboring pixels of the in-process image pixel is found. This process is carried out for the whole image. The image is scanned from three other directions also and the above mentioned process is applied to all the scans. The value of each pixel in the final output is then calculated by taking the median of the corresponding pixel in the four scans. The proposed technique is very effective for high level noise corrupted images. Extensive computer simulations indicate that this technique provides significant improvement over many other existing techniques in terms of PSNR.

Keyword : Switching median filter, impulse noise, denoising, noise detection.