Abstract

Noise removal is one of the most important parts to get original image from highly corrupted image. The image can be corrupted with noise during transmission from noisy channel, sensors or due to some environmental conditions. This makes the image visually unpleasant. Impulsive noise may occur during transmission which highly corrupts the image. In this paper an algorithm is designed to remove the impulsive noise (salt and pepper) from corrupted gray scale and color images. In past years researchers proposed many algorithms to remove the impulse noise but they fail to give better results at high noise density i.e. 80%-90%. The proposed algorithm works on two stages first stage is to detect the noisy pixel and the second stage is to replace the noisy pixel. This algorithm considers first order neighborhood pixels for detecting the noisy pixel and mean filter is used for de-noising. Color images are also de-noised by extracting the R, G and B pixels from noisy image and then they are de-noised separately and then merged together again to form the color image. All the other algorithms are compared with the proposed algorithms and found that the proposed algorithm have good noise removal capabilities at high densities. The presented algorithm shows better results than Standard Median Filter (SMF), Adaptive Median Filter (AMF), Progressive Switched Median Filter.
(PSMF), Decision Based Algorithm (DBA), Modified Decision Based Algorithm (MDBA), Modified Decision Based Unsymmetrical Trimmed Median Filter (MDBUTMF), and Modified Non-Linear Filter (MNF). Different grayscale and color images are tested by using the algorithm and it gave better Peak Signal Noise Ratio (PSNR) and Image Enhancement Factor (IEF) at low, medium and high noise densities.

References


Index Terms

Computer Science

Image Processing
Keywords
Salt and Pepper (SNP)  Mean Filter (MF)  Peak Signal Noise Ratio (PSNR)  Mean Square Error (MSE)

Image Enhancement Factor (IEF)