Abstract

In digital forensic cases, image is one of the most important parts. The existence of noise in the image causes the trace of digital counterfeiting hard to be detected. To reduce noise in an image is needed denoising technique. However, research on image denoising techniques for digital forensic needs is still very limited. In order to overcome the problem, a test was done to determine the best denoising image algorithm using Discrete Wavelete Transform method with Haar, Daubechies, Symlet and Coiflet wavelet. Some thresholding techniques such as Soft Thresholding, Hard Thresholding, Adaptive thresholding and Heursure thresholding are also used to eliminate the noise previously given to the image. The noise is referred to as Additive White Gaussian Noise (AWGN), Salt Pepper Noise, and Laplacian Noise. While for image quality testing from denoising result, MSE, SNR and PSNR assessment techniques were used. The result of the test shows that at AWGN noise and Salt and Pepper noise Soft Thresholding method is the best method with MSE value of 98,651, SNR value is 28,189 dB and PSNR value is 28,223 dB for Noise AWGN, and MSE value is 226,451, SNR value is 24,581 dB and PSNR value of 24,615 dB for Salt and Pepper noise. While for Laplacian noise, Heursure Thresholding method becomes the best method with MSE value of 0.24, SNR value is 54,269 dB and PSNR value is 54,303 dB. While the test result to determine the best wavelet base shows that the best Wavelet AWGN noise is at Coiflet 3 (Coif3) with MSE value is 98,65156667, SNR value is 28,18976374 dB, and PSNR value is 28,22375944 dB. For Laplacian noise, the best wavelet base exists on Deubechies 7 (db7) wavelet base with MSE value of 0.243283656, and SNR and PSNR values are 54,26967428 dB and 54,30366998 dB. While for Salt and Pepper noise, wavelet base exists on wavelet deubechies 7 (db7) base with MSE value 226,4511444, and SNR and PSNR values are 24,58105841 dB and 24,61505411 dB. For image authenticity testing using the Singular Value Decomposition (SVD) method, it show the authenticity of an image and similarity percentage.

Keywords: *Denoising, Discrete Wavelet Transform (DWT), Additive Gaussian Noise, Salt Pepper, Laplacian, Haar, Daubechies, Symlet, Coiflet, Digital Forensic, MSE (mean square error), SNR (Signal to noise ratio),PSNR (peak signal to noise ratio), Singular Value Decomposition (SVD).*