

Abstract

Digital image, especially medical image requires two important things, there are tamper detection and ownership. Two things should be implemented simultaneously in an image so that it can be seen if an image has been damaged, but the identity of the owner of the image will still be known well. To implement these, we need the mark (is called watermark) which can detect a damage and able to maintain the identity of owner image. Because of differences purpose that are owned, the inserted watermark consists of two types of watermark, there are signature watermark that serves as a proprietary information and reference watermarks that serves as a detector if there is an attack on the relevant image. This technique is commonly referred as multiple watermarking.

Signature watermark is inserted in the side of the image in order for which there is robust (resistant) for modifications and attacks that exist, while the reference watermark is inserted in the center of the image in order for the inserted watermark fragile (vulnerable) with a modification and an attack that given. Signature watermark insertion uses spread spectrum in the wavelet domain and the reference watermark insertion using Hash Block Chainig (HBC) with the Secure Hash Algorithm (SHA) as the hash function used. After be inserted, the performance of the image that have a watermark and watermark which generated from the extraction process will be calculated using Peak Signal to Noise Ratio (PSNR), Bit Error Rate (BER) and Mean Opinion Square (MOS).

From the test results it was concluded that the use of spread spectrum in the wavelet domain generate signature watermark is resistance to the process of sharpening, the addition of Gaussian noise and JPEG compression. In terms of fragility, the use of SHA on HBC generate the reference watermark is vulnerable to modification, particularly given the image sharpening process, the addition of Gaussian noise and JPEG compression.

Key word : multiple watermarking, spread spectrum, wavelet, secure hash algorithm, hash block chaining