Abstract

A digital image watermark is a signal permanently embedded into a digital image that can be detected or extracted later by means of some operations for authentication purposes. This paper discusses the results of evaluating three conventional image watermarking algorithms for performance and robustness. The findings are based on experiments on a standard LENA image and thus a comparative analysis between the algorithms becomes apparent and very clear. Three algorithms namely LSB (Least Significant Bit), DCT (Discrete Cosine Transform) and DWT (Discrete Wavelet Transform) were implemented in MATLAB and various results were collected with respect to performance and robustness. LSB embedded watermarks were easily removed using techniques that do not visually degrade the image to the point of being noticeable. Cosine transform algorithm was good in both performance and robustness. The wavelet domain proved to be highly resistant to both compression and noise, with minimal amounts of visual degradation but the original image was significantly affected by the embedding. The numeric data included in the paper make this comparison more formal.
Index Terms

Computer Science

Image Processing

Keywords

Image watermarking  DCT  DWT  LSB  MSE  SSIM  PSNR