An improved robust image watermarking by using different embedding strengths

Dhani Ariatmanto[1] & Ferda Ernawan[2]

[1]Faculty of Computer Science, Universitas AMIKOM Yogyakarta, Ring Road Utara Condong Catur, Sleman, Yogyakarta 55283, Indonesia

[2]Faculty of Computing, Universiti Malaysia Pahang, Lebuhraya Tun Razak, 26300 Gambang, Kuantan, Malaysia

ABSTRACT

Image watermarking technique is an alternative solution to protecting digital image copyright. This paper proposed a new embedding technique based on different embedding strengths for embedding a watermark. An image is divided into non-overlapping blocks of 8 × 8 pixels. The variance pixel value was computed for each image block. Image blocks with the highest variance value were selected for the embedding regions. Therefore, it was transformed by discrete cosine transforms (DCT). Five DCT coefficients in the middle frequency were selected and the average of selected DCT blocks was calculated to generate different embedding strengths by using a set of rules. The watermark bits were embedded by using a set of embedding rules with the proposed different embedding strengths. For an additional security, the binary watermark was scrambled by using an Arnold Transform before it was embedded. The experimental results showed that the proposed scheme achieved a higher imperceptibility than the other existing schemes. The proposed scheme achieved a watermarked image quality with a PSNR value of 46 dB. The proposed scheme also produced a high watermark extracting resistance under various attacks.

ACKNOWLEDGEMENTS