Self-Correction of Digital Images Using Self-Embedding Technique

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ABSTRACT

Digital images transferred in the internet maybe be modified by hackers. In this paper, we propose a new self-embedding image watermark to do the error detection and self-recovery of the modified images to improve the image qualities. In the embedding procedure, we use a key-dependent basis transform to transfer an image from the spatial domain into the frequency domain. The basis has arranged so that the number of zero crossing increases with the row number. The similar neighboring-block-direction-codes and the approximation of an original image are extracted and embedded them into the image in the frequency domain. After all, we get an image which is embedded with the recovering data. The embedded image maybe tampered by the attackers. After attack, we need to improve the quality of modified image. In the recovery procedure, we use the secret key to generate the basis which is the same as embedding procedure. Use the key-dependent basis, the approximation and the block-direction-codes can be extracted from the modified image. We can use them to detect error regions of the modified image and use the similar neighboring-block-direction-codes to help us recover the error regions. The experimental results have shown that the proposed self-healing method can detect and recover the error regions and improve the qualities of modified images.

Keywords : Image Watermarking, Orthonormal Basis, Key-Dependent Basis Transform, Self-Correction, DCT

Table of Contents

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