A High Payload Multiple Embedding Scheme Based Reversible Data Hiding

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Abstract. In this paper, we proposed a reversible data-embedding scheme which improves Lin et al.'s method by increasing the embedding capacity measured while maintaining good image quality. The embedding procedure consists of two phases, "horizontal embedding" and "vertical embedding." For each phase, each overlapping pixel pair of difference image is used to carry a secret bit. Though the horizontal embedding, only one pixel in the pixel pair is increased or decreased by one after a bit value has been embedded, and the vertical embedding changes pixel value in a reverse way. Therefore, the strategy of horizontal as well as vertical embedding keeps pixels intact, which makes the quality of stego-image good and stable. For all 512×512 test images, the experimental results show that the embedding capacity can achieve higher than 1 bpp and the average PSNR value greater than 37 dB for one-layer embedding. Even for fifteen-layer embedding, the embedding capacity is greater than 17 bpp and the PSNR value remains over 36 dB. Clearly, our scheme not only maintains image quality in a more stable manner than other schemes but also realizes a large amount of capacity with multiple-layer embedding.

Keywords: Operating systems, digital signal processing, e-commerce, RFID

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