An Adaptive Large DCT Psychovisual Threshold in Image Compression

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Abstract:
Nowadays, multimedia communication requires high bandwidth and data transfer rate to transfer multimedia data. Image compression is one of alternative solutions to reduce the storage and transmission. An adaptive image compression technique has been widely used in many applications, it can be done by customizing quantization tables based on user preference. A scaling factor is one of scaling techniques for customizing the quantization values uniformly. Consequently, a scaling quantization table uniformly can significantly effect to the error reconstruction and compression rate. This paper proposes an adaptive large psychovisual threshold for customizing large quantization tables in image compression. The proposed adaptive large psychovisual threshold is designed based on a smooth curve of the absolute reconstruction error by incrementing the DCT coefficients one at a time for each frequency order. The experimental results show that the performance of adaptive large DCT psychovisual threshold achieves high image quality and minimum average bit length of Huffman code. The visual image of the proposed method also clearly shows that it does not appear boundary effect when the reconstructed image was zoomed in to 400%.

Keywords: Psychovisual threshold; DCT; Image compression; Reconstruction

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