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An improved wavelet-based image coder for embedded greyscale and colour image compression

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Abstract

The embedded zero-tree wavelet (EZW) coding algorithm is a very effective technique for low bitrate still image compression. In this paper, an improved EZW algorithm is proposed to achieve a high compression performance in terms of PSNR and bitrate for lossy and lossless image compression, respectively. To reduce the number of zerotrees, the scanning and symbol redundancy of the existing EZW; the proposed method is based on the use of a new significant symbol map which is represented in a more efficient way. Furthermore, we develop a new EZW-based schemes for achieving a scalable colour image coding by exploiting efficiently the interdependency of colour planes. Numerical results demonstrate a significant superiority of our scheme over the conventional EZW and other improved EZW schemes with respect to both objective and subjective criteria for lossy and lossless compression applications of greyscale and colour images.

Keywords: Embedded greyscale and colour image coding, lossy/lossless image coding, EZW algorithm, zerotree coding, wavelet transform

1. Introduction

Digital images are widely used in computer applications. Uncompressed digital images require considerable storage capacity and transmission bandwidth.

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