Abstract

Set Partitioning in Hierarchical Trees (SPIHT) is an efficient method for compressing images under low bit rates. No List SPIHT (NLS) and Wavelet Based Block Tree Coding (WBTC) are two enhanced algorithms of SPIHT. The WBTC algorithm works on blocks instead of pixels in SPIHT. The size of root block in WBTC varies from one step to another. This reduces the memory requirement to a great extent. NLS uses markers instead of lists used for the storage of coefficients in SPIHT. The three lists used in SPIHT to manage the significant coefficients grow exponentially with each step as more number of coefficients is tracked. Due to this feature SPIHT algorithm requires a lot of memory management and hence it is complex for hardware implementation. But the 8 different markers used in NLS removes this drawback of original algorithm. Listless Block Tree Coding algorithm (LBTC) is evolved by combining the WBTC and NLS algorithms. In this algorithm image compression is performed on the block basis and the significant coefficients are tracked with the help of different markers. The LBTC algorithm when combined with Discrete Wavelet Transform (DWT) performs even well in the terms of Peak Signal to Noise Ratio (PSNR) and Mean Square Error (MSE). In this paper arithmetic encoding is applied on the LBTC-DWT algorithm which further enhances the compressed image quality in
terms of PSNR and MSE though the time taken increases.

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Index Terms

Computer Science

Image Processing

Keywords
SPIHT  Block tree  NLS  LBTC  DWT  Arithmetic Encoding.