Abstract

This paper analyses wavelet filters and SPIHT encoding techniques in compression and decompression of medical images. Medical images acquired have uneven aspect ratio, region of interest decides the aspect ratio, and compression algorithm performance varies based on aspect ratio. This paper tries to offer a novel algorithm that preprocesses the input image with uniform aspect ratio prior to compression. Various DWT filters have been experimented with, to select the right type of filters for compressing and decompressing the images without sacrificing on the quality. Filter selection and its impact on compression ratio are also analyzed. Biorthogonal (Bior) and Daubechies (DB) achieve PSNR in the range of 45dB to 52dB for lossless compression. The modified algorithm proposed, normalizes the aspect ratio prior to compression using Discrete Wavelet Transform and SPIHT. The compressed bit stream is grouped into 128 bits and for each 128 bits hamming code is generated for error correction and detection. Various medical images have been used to validate the proposed compression algorithm and the developed algorithm is suitable for telemedicine applications.
- Changhe Song, Yunsong Li, and Bormin Huang A GPU-Accelerated Wavelet Decompression System With SPIHT and Reed-Solomon Decoding for Satellite Images, IEEE JOURNAL OF SELECTED TOPICS IN APPLIED EARTH OBSERVATIONS AND REMOTE SENSING, VOL. 4, NO. 3, SEPTEMBER 2011, pp:683-690
Performance analysis of DWT-SPIHT Algorithm for Medical Image Compression with Uniform Aspect Ratio

Signal Processing, pp. 1080–1089, 2004

Index Terms

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Keywords

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