

Dicom Color Medical Image Compression using 3D-SPIHT for Pacs Application

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The proposed algorithm presents an application of 3D-SPIHT algorithm to color volumetric dicom medical images using 3D wavelet decomposition and a 3D spatial dependence tree. The wavelet decomposition is accomplished with biorthogonal 9/7 filters. 3D-SPIHT is the modern-day benchmark for three dimensional image compressions. The three-dimensional coding is based on the observation that the sequences of images are contiguous in the temporal axis and there is no motion between slices. Therefore, the 3D discrete wavelet transform can fully exploit the inter-slices correlations. The set partitioning techniques involve a progressive coding of the wavelet coefficients. The 3D-SPIHT is implemented and the Rate-distortion (Peak Signal-to-Noise Ratio (PSNR) vs. bit rate) performances are presented for volumetric medical datasets by using biorthogonal 9/7. The results are compared with the previous results of JPEG 2000 standards. Results show that 3D-SPIHT method exploits the color space relationships as well as maintaining the full embeddedness required by color image sequences compression and gives better performance in terms of the PSNR and compression ratio than the JPEG 2000. The results suggest an effective practical implementation for PACS applications.

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