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Volumetric Color Image Compression Using Set Partitioning Methods

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Abstract- In this work we present the applications of three dimensional set partitioning methods to the sequence of still color images . The set partitioning methods we use in this aer are SPIHT, a state of the art encoder and SPECK, a more recently developed , low complexity encoder . The three- dimensional versions of these methods are based on the observation that the sequences of the 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 " bit plan " coding of the wavelet coefficients , where the SPECK uses a cube-splliting quantization structure and the SPIHT uses a zerotree-like quantization structure . We extend the 3D -speck and 3D-SPIHT to code the color image sequences and call these schemes 3D- CSPECK and 3D-CSPIHT . Rate distortion (Peak signal to noise ratio (PSNR) vs . bit rate) performances were presented by comparing 3D-CSECK and 3D- CSIHT on the sequence of visible human datasets . Results show that 3D- CSPECK is comparable to 3D- CSPIHT, which matches the published results of gray scale image sequence compression .