Error Concealment for 3-D DWT Based Video Codec Using Iterative Thresholding

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Error concealment for video coding based on a 3-D discrete wavelet transform (DWT) is considered. We assume that the video sequence has a sparse representation in a known basis different from the DWT, e.g., in a 2-D discrete cosine transform basis. Then, we formulate the concealment problem as l1-norm minimization and solve it utilizing an iterative thresholding algorithm. Comparing different thresholding operators, we show that video block-matching and 3-D filtering provide the best reconstruction by utilizing spatial similarity within a frame and temporal similarity between neighbor frames. Experimental results show that the proposed error concealment provides up to 6-dB improvement in the peak signal-to-noise ratio in comparison with existing recovery methods.

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