INTRA−ADAPTIVE MOTION−COMPENSATED LIFTED WAVELETS FOR VIDEO CODING (WedAmPO4)

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Abstract :

This paper investigates intra−adaptive wavelets for video coding with frame−adaptive motion−compensated lifted wavelet transforms. With motion−compensated lifted wavelets, the temporal wavelet decomposition operates along motion trajectories. However, valid trajectories for efficient multi−scale filtering have a finite duration in time. This is due to well known effects like occlusions or inaccurate motion estimation. These discontinuities may generate many non−zero wavelet coefficients when a transform with a fixed dyadic structure is used. To investigate the advantage of an adaptive transform, we introduce intra macroblocks in the frame−adaptive lifting steps. Depending on the rate−distortion costs at a given macroblock location, we choose the number of wavelet decomposition levels locally. We discuss motion−compensated lifted wavelets that are frame− and intra−adaptive. We evaluate the efficiency of intra−adaptive wavelets when frame−adaptive motion−compensated wavelets are used. We observe that intra−adaptivity is rate−distortion efficient for discontinuities that cannot be handled by frame−adaptivity.

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