

BLOCK MOTION ESTIMATION USING WAVELET FILTERING

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ABSTRACT

Block-matching motion compensation achieves savings in residual error energy at the cost of motion vector bitrate. While this tradeoff has proven valuable on average for all blocks of most video sequences, there are many obvious examples of blocks for which the cost of motion vectors is not offset by the gains of motion compensation. This paper proposes a multiresolution framework for motion-compensated prediction that offers a richer set of options for trading off motion compensation accuracy against the cost of motion vectors. The method improves the prediction at motion boundaries and on covered/uncovered regions, while reducing the bitrate by using less accurate motion vectors in smoother regions. The new algorithm is compared to the full-search block-matching in various simulations, and the results show that the algorithm achieves a 10%-30% reduction in motion vector bitrate. These savings are particularly important in low bitrate applications where motion overhead constitutes a significant percentage of overall bitrate.