Fast Mode Decision for H.264/AVC Based on Clustering of MPEG-7 Texture Descriptor Values

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Abstract : As multimedia content is rapidly increasing everyday, the availability of indexing metadata such as MPEG-7 descriptors becomes increasingly important for accessibility purposes. However, the use of this indexing metadata in improving coding efficiency has rarely been explored. A novel fast mode decision algorithm for H.264/AVC encoders based on the use of an MPEG-7 descriptor is proposed in this paper. The descriptor is used to form homogenous clusters within a picture frame and a range of coding modes is decided for each macroblock based on the mode of an already coded macroblock that belongs to the same cluster. The experimental results show that the proposed algorithm is able to achieve an average of 35% time-saving when compared to the full search method and 15% time-saving when compared to the fast mode decision algorithm employed in the recent JM12.2 reference H.264 software encoder. In both cases, results yield only a small degradation in rate-distortion performance and a negligible lost in subjective quality.