

Transrating of Coded Video Signals via Optimized Index-modified Requantization[★]

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Abstract

Requantization is one of the tools for bit-rate reduction of pre-encoded video to adapt it to various network bandwidth constraints. Several recent works propose using Lagrangian optimization to find the optimal quantization step, for each coded macro-block, to meet a desired rate at minimum distortion. In this paper we propose to extend the Lagrangian optimization procedure by allowing modification of quantized coefficients values, including setting their values to zero, in addition to quantization step-size selection. Thus, for each selected step-size the run-level values, which serve as indices in the VLC table, may get modified so that the overall distortion for a given overall rate is reduced. Coefficient value modification and quantization step-size selection are optimally done using a low complexity trellis-based algorithm. The proposed requantization algorithm is implemented in an MPEG-2 environment. It provides higher PSNR values than the Lagrangian-based optimization method that only handles the selection of quantization steps, and still does not exceed considerably its complexity.

Key words: MPEG-video, transcoding, requantization, trellis

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