MSE APPROXIMATION FOR MODEL−BASED COMPRESSION OF MULTIRESOLUTION SEMIREGULAR MESHES (ThuAmOR6)

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Abstract :

It is well known in wavelet image coding that biorthogonality of wavelet filters influences the estimation of the Mean Square Error (MSE) due to data quantization. It has been indeed shown that the MSE can be approximated by a weighted MSE with the weights depending on the synthesis filters. These works have been carried on canonical sampling grid for 1D signals or 2D images. In this paper we propose an elegant solution to compute the weights in case of 3D meshes sampled on a triangular grid. We show that the weights can depend only on the polyphase components of the synthesis filter bank, allowing an easy computation for filters based on a lifting scheme. In particular, we compute the weights for the well−known Butterfly lifting scheme. Then we show that using the proposed MSE approximation improves the performances of a model−based bit allocation process. We obtain an encoding gain up to 3.5 dB compared to the state−of−the−art zerotree coders.

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