A New Approach to Distributed Coding Using Sampling of Signals with Finite Rate of Innovation

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Abstract : This paper proposes a new approach to distributed video coding. Distributed video coding is based on the concept of decoding with side information at the decoder. Such a coding scheme employs a low-complexity encoder and the load of computational complexity is shifted to the decoder side. This property makes it well suited for low-power devices such as mobile video cameras. The uniqueness of our approach lies in the combined use of discrete wavelet transform (DWT) and the concept of sampling of signals with finite rate of innovation (FRI), which allow us to shift the task of motion estimation to the decoder side. Unlike the currently existing practical coders, we do not employ any traditional channel coding technique. Our preliminary results show that, for a simple video sequence with a uniform background, the proposed coding scheme can achieve a better PSNR than JPEG2000-intraframe coding at low bit rates.