

Title: Augmented LDPC Graph for Distributed Video Coding with Multiple Side Information

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Abstract: The advances made in channel-capacity codes, such as turbo codes and low-density parity-check (LDPC) codes, have played a major role in the emerging distributed source coding paradigm. LDPC codes can be easily adapted to new source coding strategies due to their natural representation as bipartite graphs and the use of quasi-optimal decoding algorithms, such as belief propagation. This paper tackles a relevant scenario in distributed video coding: lossy source coding when multiple side information (SI) hypotheses are available at the decoder, each one correlated with the source according to different correlation noise channels. Thus, it is proposed to exploit multiple SI hypotheses through an efficient joint decoding technique with multiple LDPC syndrome decoders that exchange information to obtain coding efficiency improvements. At the decoder side, the multiple SI hypotheses are created with motion compensated frame interpolation and fused together in a novel iterative LDPC based Slepian-Wolf decoding algorithm. With the creation of multiple SI hypotheses and the proposed decoding algorithm, bitrate savings up to 8.0% are obtained for similar decoded quality.

KeyWords Plus: Decoder

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