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Title: Statistical motion learning for improved transform domain Wyner-Ziv video coding

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Abstract: Wyner - Ziv (WZ) video coding is a particular case of distributed video coding (DVC), the recent video coding paradigm based on the Slepian - Wolf and Wyner - Ziv theorems which exploits the source temporal correlation at the decoder and not at the encoder as in predictive video coding. Although some progress has been made in the last years, WZ video coding is still far from the compression performance of predictive video coding, especially for high and complex motion contents. The WZ video codec adopted in this study is based on a transform domain WZ video coding architecture with feedback channel-driven rate control, whose modules have been improved with some recent coding tools. This study proposes a novel motion learning approach to successively improve the rate-distortion (RD) performance of the WZ video codec as the decoding proceeds, making use of the already decoded transform bands to improve the decoding process for the remaining transform bands. The results obtained reveal gains up to 2.3 dB in the RD curves against the performance for the same codec without the proposed motion learning approach for high motion sequences and long group of pictures (GOP) sizes.

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