Author(s): Martins, R (Martins, R.); Brites, C (Brites, C.); Ascenso, J (Ascenso, J.); Pereira, F (Pereira, F.)

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

Source: IET Image Processing, 4 (1): 28-41 FEB 2010

Language: English

Document Type: Article

KeyWords Plus: Information

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.

Addresses: [Martins, R.; Brites, C.; Pereira, F.] UTL, Inst Telecomunicacoes, Inst Super Tecn, P-1049001 Lisbon, Portugal; [Ascenso, J.] Inst Super Engn Lisboa, Inst Telecomunicacoes, P-1959007 Lisbon, Portugal

Reprint Address: Martins, R, UTL, Inst Telecomunicacoes, Inst Super Tecn, Av Rovisco Pais, P-1049001 Lisbon, Portugal.

E-mail Address: ricardofmartins@ist.utl.pt

Publisher: Inst Engineering Technology-IET

Publisher Address: MICHAEL FARADAY HOUSE SIX HILLS WAY STEVENAGE, HERTFORD SG1 2AY, ENGLAND

ISSN: 1751-9659

DOI: 10.1049/iet-ipr.2008.0133

29-char Source Abbrev.: IET IMAGE PROCESS

ISO Source Abbrev.: IET Image Process.

ISI Document Delivery No.: 540NN