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Authors:

Nejmeddine Bahri

Imen Werda

Amine Samet

Mohamed Ali Ben Ayed

Nouri Masmoudi

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Abstract

The high performance of H.264/AVC video encoder is accompanied with a wide computation complexity especially for high definition (HD) video sequences. One of the major H.264/AVC features to be optimized is the mode decision for both inter and intra prediction. Thus, based on high correlation observed between selected inter prediction mode and intra mode decision, a fast intra mode decision algorithm based on the best inter prediction mode for H264 high definition (HD) baseline profile encoder is proposed. The evaluation of the proposed approach was based on the rate distortion and PSNR variation, execution time and percentage of skipping intra4x4 and intra16x16. The proposed scheme is performed on 720p (1280x720) and

1080p (1920x1088) HD video sequences. Experimental results show that the proposed algorithm can save up to 60% of intra prediction computation time, 16% of skipping intra16x16 and up to 83% for intra4x4 without inducing PSNR degradation and bit-rate increase.

References

ences

- Joint Video Team (JVT) of ISO/IEC MPEG & ITU-T VCEG, "Draft ITU-T Recommendation and Final Draft international Standard of Joint Video Specification (ITU-T Rec. H.264 ISO/IEC 14496-10 AVC)", JVT-G050, 2003.
- H264/MPEG-4 AVC Wikipedia the free encyclopedia:http://en.wikipedia.org/wiki/H.264/MPEG-4_AVC
- H.264 HD Baseline Profile Encoder (v2.00) on DM6446:
http://www.ti.com/lit/ml/sprs527/sprs_527.pdf
- Main / Baseline Profile HD h264 Encoder
<http://www.eyelytics.com/Products/H264Encoder.html>
- H264-BP-E H.264/AVC HD & ED Video Encoder Core
<http://www.cast-inc.com/ip-cores/video/h264-bp-e/index.html>
- Imen Werda, Haithem Chaouch, Amine Samet, Mohamed Ali Ben Ayed and Nouri Masmoudi, "Optimal DSP-Based Motion Estimation Tools Implementation For H.264/AVC Baseline Encoder," IJCSNS International Journal of Computer Science and Network Security, VOL.7 No.5, May 2007.
- F. Pan, X. Lin, S. Rahardja, K. P. Lim, Z. G. Li, D. Wu, and S. Wu, "Fast mode decision algorithm for intra prediction in H.264/AVC video coding," IEEE Transactions on Circuits and Systems for Video Technology, vol. 15, no. 7, pp. 813-822, July 2005.
- Chao-Chung Cheng and Tian-Sheuan Chang, "Fast Three Step Intra Prediction Algorithm for 4x4 blocks in H.264," Proc. IEEE Canadian Conference on Electrical and Computer Engineering, pp1981-1984, May 2003.
- Sourabh Rungta, Kshitij Verma and Anupam Shukla, "A Fast Mode Selection Algorithm Using Texture Analysis for H.264/AVC," IJCSI International of computer Sciences Issues, Vol. 7, Issue 4, No 9, July 2010
- Takeshi. Tsukuba, Isao. Nagayoshi, Tsuyoshi. Hanamura and Hideyoshi. Tominaga, "H.264 Fast Intra-Prediction Mode Decision Based on Frequency Characteristic," Proc. of European Signal Processing Conference (EUSIPCO), 2005.
- Jun Sung Park and Hyo Jung Song, "Fast selective intra mode decision H.264/AVC," IEEE Consumer Communications and Networking Conference 2006.3rd, Vol.2, pp.1068-1072 Jan. 2006.
- Yi-Hsin Huang, Tao-Sheng Ou, and Homer H. Chen, "Fast Decision of Block Size, Prediction Mode, and Intra Block for H.264 Intra Prediction," IEEE transactions on circuits and systems for video technology, Vol.20, No.8, august 2010.
- Yu-Kun Lin, Chun-Wei Ku, De-Wei Li, and Tian-Sheuan Chang, "A 140-MHz 94 K Gates HD1080p 30-Frames/s Intra-Only Profile H.264 Encoder," IEEE transactions on circuits and systems for video technology, Vol.19, No.3, March 2009.
- Mohammed Golam Sarwer and Q. M. Jonathan Wu, "Improved Intra Prediction of H.264/AVC," Effective Video Coding for Multimedia Applications, Sudhakar Radhakrishnan

(Ed.), ISBN: 978-953-307-177-0, InTech (2011).

- Harald Jordan, Florian H. Seitner, Michael Bleyer and Margrit Gelautz, "Runtime-Optimised Intra-4×4 Mode-Decision for H.264/AVC Video Encoding," Proceedings of the 6th International Symposium on Image and Signal Processing and Analysis (2009)
- A.Elyousfi, A.Tamtaoui and E.Bouyakhf, "Fast Intra Prediction Algorithm for H.264/AVC Based on Quadratic and Gradient Model," World Academy of Science, Engineering and Technology 63, 2010.
- Jeon B and J. Lee, "Fast Mode Decision for H264", ISO/IEC JTC1/SC29/WG11 and ITU-T SG16, Input Document JVT-J033 (2003, December).
- The H.264/AVC encoder reference software JM 17.1:
http://iphome.hhi.de/suehring/tml/download/old_jm/

Computer Science

Index Terms

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Keywords

H264/AVC Fast intra mode decision High definition baseline profile.