Abstract

A de-interlacing algorithm using adaptive 4-field motion compensation approach is presented. It consists of block-based directional edge interpolation, same-parity 4-field motion detection, 4-field motion estimation and compensation. The intra field methods are reconstructed from the current field information, but this method introduces edge flicker problems and...
jitter effect. The inter field methods are depends on the previous and future fields for reconstruction of the current frame. This method introduces feathering effect. The edges are sharper when the directional edge interpolation is adopted and jitter effect and the feathering effect eliminated. The motion adaptive deinterlacing scheme is taking the advantages of both intra and inters field methods. First it finds the motion by using motion detection scheme if the field contain motion apply intra field interpolation method if the field contain stationary objects apply the inter field interpolation method. The 3-field motion detection can not detect the fast motion areas from field to field. The same parity 4-field motion adaptive deinterlacing and the 4-field motion compensation detect the static areas and fast motion by four reference fields. The Compensation recovers the interlaced videos to the progressive ones but the feathering effect is not recovered in this method. The adaptive 4-field motion compensation method removes the feathering effect along with detecting fast motion areas by using four reference fields.

Experimental results show that the peak signal-to-noise ratio of our adaptive 4-field motion compensation deinterlacing algorithm is 4 to 6 dB higher than that of 3-field motion adaptive deinterlacing and 2 to 3 dB higher than 4-field motion compensation deinterlacing and attain the best quality of video.

Reference

- Berna Erol, Michael Gallant, Student Member, IEEE, and Faouzi Kossentini, Member, IEEE, Guy Cote, Student Member, IEEE “H.263+ Video Coding at Low Bit Rates”, vol. 8, no. 7, November 1998.
- Xin Li, Member, IEEE, and Michael T. Orchard, Fellow, IEEE, "New Edge-Directed Interpolation" VOL. 10, NO. 10, October 2001.
- Yoon Kim1, Kang-Sun Choi1, Jae-Young Pyun1, Byung-Tae Choi2, and Sung-Jea Ko1 1 “A Novel De-interlacing Technique Using Bi-directional Motion Estimation “Department of Electronics Engineering, Korea University, Anam-Dong, Sungbuk-Ku, Seoul 136-701, Korea
- Yu-Lin Chang, Shyh-Feng Lin, Ching-Yeh Chen, and Liang-Gee Chen “Video
De-Interlacing by Adaptive 4- Field Global/Local Motion Compensated Approach”, Fellow, IEEE, vol 15, no.12, December 2005.

**Index Terms**

Computer Science Multimedia

**Key words**

Deinterlacing motion estimation motion compensation SAD