YUV Deblocking Technology

Comprehensive solution to minimize visible blockiness in compressed video

Digital video streams are compressed using lossy codecs. During playback of decompressed video, blocking artifacts commonly appear.

Our technology minimizes these blocking artifacts, significantly improving the visual quality of decoded video

Primary applications

- Flat-panel plasma displays
- LCD displays
- Digital television
- Video CD/DVD/DivX players
- Stream post-processing for software video players including web-conferences and video-on-demand solutions

Key features

- Designed for 8x8 pixel blocks
- Includes low-complexity and high-quality algorithms
- Fully automatic
- Preserves details
- Suitable for hardware implementation

Basic Deliverables

- Source code for a reference implementation in C
- C and assembly language source code for an implementation optimized for the PC (if required)
- Algorithm description
- Software description
- Verification instructions

Decoded video

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Post-processed video

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Specification

- Designed for 8x8 pixel blocks with no other codec restrictions; thus compatible with MPEG-1, MPEG-2, MPEG-4, H.261, H.263 and other similar compressed video streams
- No side information from video decoder used
- Two algorithms included:
  - low-complexity Basic Deblocking for video compressed at medium and high bitrates (more than 500 kbps for 704x576 resolution)
  - high-quality Smart Deblocking for highly compressed video
- Fully automatic
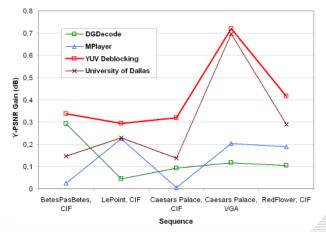- Preserves details
- Improves PSNR by up to 1 dB

- Greatly improves subjective video quality
- Smart Deblocking attempts to restore damaged object edges
- Uses only 1 input frame to produce 1 output frame
- Processing is performed in the YUV 4:2:0 color space; all planes processed independently
- Processing is localized to a 24x24 pixel window
- Memory usage of approximately 12 bytes per pixel for Basic Deblocking and 37 bytes per pixel for Smart Deblocking
- Performance of non-optimized C reference model of Basic Deblocking is 15 fps for a 4CIF (704x576) video on an Intel Pentium 4 2.8 GHz PC

Comparison with Competitors

University of Texas
at Dallas Deblocking

YUV Deblocking

Average Y-PSNR Gain after Deblocking