INTERNATIONAL STANDARD ISO/IEC 11172-2:1993
TECHNICAL CORRIGENDUM 4

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Information technology — Coding of moving pictures and associated audio for digital storage media at up to about 1,5 Mbit/s —

Part 2: **Video**

TECHNICAL CORRIGENDUM 4

Technologies de l'information — Codage de l'image animée et du son associé pour les supports de stockage numérique jusqu'à environ 1,5 Mbit/s —

Partie 2: Vidéo

RECTIFICATIF TECHNIQUE 4

Technical Corrigendum 4 to ISO/IEC 11172-2:1993 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 29, *Coding of audio, picture, multimedia and hypermedia information.*

In subclause 1.2, remove the following:

IEEE Draft Standard P1180/D2 1990 *Specification for the implementation of 8 x 8 inverse discrete cosine transform".*

In subclause 1.2, insert the following:

ISO/IEC 23002-1, *Information technology — MPEG video technologies — Part 1: Accuracy requirements for implementation of integer-output 8x8 inverse discrete cosine transform*

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In subclause 2.4.4.1, "Intra-coded macroblocks", replace the following:

Once the DCT coefficients are reconstructed, the inverse DCT transform defined in Annex A shall be applied to obtain the inverse transformed pel values in the range [-256, 255]. These pel values shall be limited to the range [0, 255] and placed in the luminance and chrominance matrices in the positions defined by mb_row, mb_column, and the list defined by the array pattern_code[].

with:

Once the DCT coefficients are reconstructed, an inverse DCT that conforms to the requirements specified in Annex A shall be applied to obtain inverse transformed pel values. The inverse transformed pel values shall be limited to the range [0, 255] and placed in the luminance and chrominance matrices in the positions defined by mb_row, mb_column, and the pattern_code list.

In subclause 2.4.4.2, "Predictive-coded macroblocks in P-pictures", replace the following:

Once the DCT coefficients are reconstructed, the inverse DCT transform defined in Annex A shall be applied to obtain the inverse transformed pel values in the range [-256, 255]. The inverse DCT pel values shall be added to the pel[i][j] which were computed above using the motion vectors. The result of the addition shall be limited to the interval [0,255]. The location of the pels is determined from mb_row, mb_column, and the pattern_code list.

with:

Once the DCT coefficients are reconstructed, an inverse DCT that conforms to the requirements specified in Annex A shall be applied to obtain inverse transformed pel values. The inverse transformed pel values shall be added to the pel[][] which were computed above using the motion vectors. The result of the addition shall be limited to the interval [0,255] and placed in the luminance and chrominance matrices in the positions defined by mb_row, mb_column, and the pattern_code list.

In subclause 2.4.4.3, "Predictive-coded macroblocks in B-pictures", replace the following:

Once the DCT coefficients are reconstructed, the inverse DCT transform defined in Annex A shall be applied to obtain the inverse transformed pel values in the range [-256, 255]. The inverse DCT pel values shall be added to the pel[][], which were computed above using the motion vectors. The result of the addition shall be limited to the interval [0,255]. The location of the pels is determined from mb_row, mb_column, and the pattern_code list.

with:

Once the DCT coefficients are reconstructed, an inverse DCT that conforms to the requirements specified in Annex A shall be applied to obtain inverse transformed pel values. The inverse transformed pel values shall be added to the pel[][] which were computed above using the motion vectors. The result of the addition shall be limited to the interval [0,255] and placed in the luminance and chrominance matrices in the positions defined by mb_row, mb_column, and the pattern_code list.

Replace subclause 2.4.4.5, "Forced updating", which states as follows:

This function is achieved by forcing the use of an intra-coded macroblock. The update pattern is not defined. For control of accumulation of IDCT mismatch error, each macroblock shall be intra-coded at least once per 132 times it is coded in a P-picture without an intervening I-picture.

with:

This function is achieved by forcing the use of intra-coded macroblocks as a requirement for conformance of the bitstream. No particular pattern for intra macroblock coding is specified. For control of accumulation of IDCT mismatch error, it is a requirement of bitstream conformance that each macroblock shall be intra-coded at least once within each series of 132 times that it is coded in a P-picture without an intervening I-picture. For purposes of counting the number of times a macroblock is coded in P-pictures, a skipped macroblock is not considered to be a coded macroblock.

Replace Annex A, "8 by 8 Inverse discrete cosine transform":

Annex A

(normative)

8 by 8 Inverse discrete cosine transform

The 8 by 8 inverse discrete cosine transform for I-pictures and P-pictures shall conform to IEEE Draft Standard, P1180/D2, July 18, 1990. For B-pictures this specification may also be applied but may be unnecessarily stringent. Note that clause 2.3 of P1180/D2 "Considerations of Specifying IDCT Mismatch Errors" requires the specification of periodic intra-coding in order to control the accumulation of mismatch errors. The maximum refresh period requirement for this part of ISO/IEC 11172 shall be as stated in 2.4.4.5, which is the same as indicated in P1180/D2 for visual telephony according to Recommendation ITU-T H.261:1993.

with:

Annex A

(normative)

8 by 8 Inverse discrete cosine transform

The 8 by 8 inverse discrete cosine transform (IDCT) approximation that is used in the decoding process for I-pictures and P-pictures shall conform to the accuracy requirements specified for conformance to ISO/IEC 23002-1. Passing the additional tests specified in ISO/IEC 23002-1 Annexes A and B is encouraged but not required.

Note that for B-pictures the use of an integer approximation of the ideal 8 by 8 IDCT process is also necessary, and that the use of an IDCT approximation that conforms to the requirements specified in ISO/IEC 23002-1 may be beneficial. However, the accuracy requirements specified in ISO/IEC 23002-1 may be unnecessarily stringent for the decoding of B-pictures and are thus not required for the decoding of B-pictures in conformance to this International Standard.