INTERNATIONAL STANDARD ISO/IEC 14496-4:2004

TECHNICAL CORRIGENDUM 2

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Information technology — Coding of audio-visual objects —

Part 4: Conformance testing

TECHNICAL CORRIGENDUM 2

Technologies de l'information — Codage des objets audiovisuels —

Partie 4: Essai de conformité

RECTIFICATIF TECHNIQUE 2

Technical Corrigendum 2 to ISO/IEC 14496-4:2004 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 29, *Coding of audio, picture, multimedia and hypermedia information.*

In Clause 2, "Normative references", remove the following:

"IEEE Standard Specifications for the Implementations of 8 by 8 Inverse Discrete Cosine Transform, IEEE Std 1180-1990, December 6, 1990"

ICS 35.040 **Ref. No. ISO/IEC 14496-4:2004/Cor.2:2007(E)**

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In Clause 2, "Normative references", add the following:

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

In 5.3, "Procedure for testing bitstream compliance", replace

"A verifier which does perform the IDCT transform and calculates the reconstructed samples must comply with all the arithmetic precision requirements specified in ISO/IEC 14496-2. In addition, the IDCT of such a verifier shall be an embodiment of the saturated mathematical integer-number IDCT specified in Annex A of ISO/IEC 14496-2 (a software implementation using 64-bit double-precision floating-point is sufficient)."

with the following:

"A verifier which does perform the IDCT transform and calculates the reconstructed samples must comply with all the arithmetic precision requirements specified in ISO/IEC 14496-2. In addition, the IDCT of such a verifier shall be an embodiment of the mathematical integer-number IDCT specified in Annex A of ISO/IEC 14496-2:2004 (a software implementation using 64-bit double-precision floating-point is sufficient)."

In 5.4, "Definition of visual decoder compliance", replace

"The reference decoder is a decoder that implements precisely the decoding process as specified in ISO/IEC 14496-2. The IDCT function that shall be used when running the reference decoder is the very accurate approximation of the mathematical saturated integer-number IDCT specified in Annex A of ISO/IEC 14496-2 obtained by implementing IDCT with double-precision arithmetic."

with the following:

"The reference decoder is a decoder that implements precisely the decoding process as specified in ISO/IEC 14496-2. The IDCT function that is used when running the reference decoder shall be an embodiment of the mathematical integer-number IDCT specified in Annex A of ISO/IEC 14496-2:2004 (a software implementation using 64-bit double-precision floating-point is sufficient)."

Replace the content of 5.4.2, "Requirement on arithmetic accuracy in video objects (with IDCT)", with the following:

"When a bitstream contains some 8x8 blocks with non-zero DCT coefficients, the output of a compliant decoder may differ from the output of the reference decoder. However, because of the accuracy requirements on the IDCT implementation used by the decoder, there exist some accuracy requirements on the output of a compliant ISO/IEC 14496-2 video decoder.

The IDCT implementation used in a compliant decoder shall meet all the requirements defined in Annex A of ISO/IEC 14496-2:2004, including all tests specified therein."

In 5.5.3, "Specification of the test bitstreams", replace

"All the bitstreams in the test suite must be such that the output of the non-saturated integer number mathematical IDCT, as defined in Annex A of ISO/IEC 14496-2, has values within the range [-384, 383] for each coded block."

with the following:

"All the bitstreams in the test suite must be such that the output of the mathematical integer-number IDCT, as defined in Annex A of ISO/IEC 14496-2:2004, has values within the range [-384, 383] for each coded block."

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Replace the content of 5.5.3.1.15, "Test bitstream #GE-19", with the following:

"**Specification**: A bitstream implementing a test close to the ISO/IEC 23002-1 main body IDCT mismatch test, to test the decoder's IDCT statistical accuracy. The test can be performed using I-VOPs with quant_type equal to 1, a flat custom quantisation matrix with all entries W[w][v][u] equal to 8, and quantiser_scale equal to 1. Use whatever number of VOPs are required to satisfy a statistic count corresponding to the requirements of Annex A of ISO/IEC 14496-2:2004 for use in ISO/IEC 23002-1 IDCT testing. Note that because of the saturation range of [0, 255] in the video decoding process, the test cannot exactly emulate the ISO/IEC 23002-1 main body IDCT test.

Functional stage: IDCT

Purpose: Check IDCT decoder accuracy. This is not a drift test since all macroblocks are of type Intra."

Replace the content of 5.5.3.1.18, "Test bitstream #GE-22", with the following:

"**Specification**: Bitstream causing large positive sample domain coefficients f[y][x] (e.g., 255) added to large predicted values p[y][x] (e.g., 255), or large negative sample domain coefficients f[y][x] (e.g., -256) added to small predicted values p[y][x] (e.g., 0).

Functional stage: addition of the output of IDCT f[y][x] to the predicted values p[y][x] and saturation of the result to the range $[0, 2^n - 1]$.

Purpose: Test that decoder implements properly the addition of the output of IDCT f[y][x] to the predicted values p[y][x] and saturation of the result to the range $[0, 2^n - 1]$."

Replace the content of 5.5.3.1.21, "Test bitstream #GE-25", with the following:

"**Specification**: A bitstream in which the output of the mathematical integer-number IDCT f ' (x, y), as defined in Annex A of ISO/IEC 14496-2, has large absolute values within the range $[-2^n-2^{n-1}, 2^n+2^{n-1}-1]$ for each coded block, where n is the maximum allowed number of bits per pixel for the profile-and-level combination.

Functional stage: IDCT

Purpose: Check that IDCT decoder accuracy meets the requirements defined in Annex A of ISO/IEC 14496-2:2004. The peak absolute error for a compliant decoder shall be less than or equal to 2 when decoding this bitstream. Note that for blocks where f ' (x, y) has values within the range [-300, 300], decoders that have a peak absolute error larger than 1 may not be compliant with the main body of ISO/IEC 23002-1."

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