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Information technology - MPEG video technologies - Part 1: Accuracy requirements for implementation of integer-output 8x8 inverse discrete cosine transform

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Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work. In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of the joint technical committee is to prepare International Standards. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights.

ISO/IEC 23002-1 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information Technology*, Subcommittee SC 29, *Coding of audio, picture, multimedia and hypermedia information*.

ISO/IEC 23002 consists of the following parts, under the general title *Information technology — MPEG video technologies*:

— *Part 1: Accuracy requirements for implementation of integer-output 8x8 inverse discrete cosine transform*

The following part is under preparation:

— *Part 3: Auxiliary video data representation*

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Information technology — MPEG video technologies —

Part 1:

Accuracy requirements for implementation of integer-output 8x8 inverse discrete cosine transform

1 Scope

A number of image and video coding related standards (see Bibliography) include a requirement for decoders to implement an integer-output 8x8 inverse discrete cosine transform (IDCT) for the generation of inverse-transformed sample differences with a nominal range from -2^B to $(2^B)-1$ for some integer number of bits B , where B is greater than or equal to 8. This part of ISO/IEC 23002 specifies conformance requirements for establishing sufficient accuracy in such an integer-output IDCT implementation. It is intended to be suitable for reference to establish partial or complete requirements for IDCT accuracy for conformance to other standards that require IDCT use.

The accuracy requirements specified in the main body of this part of ISO/IEC 23002 are essentially the same as those previously specified in [7], in Annex A of [1], and in Annex A of [5]. These requirements have been specified herein to resolve normative references to [7] in MPEG standards after its withdrawal and to provide improved clarity for the specification of IDCT accuracy requirements.

An additional requirement on encoded-bitstream intra refresh frequency was also previously specified in [7], establishing a requirement of bitstream conformance that each macroblock be intra-coded at least once within each series of 132 times that it is coded in a predicted picture without an intervening intra picture. That additional requirement is not specified in this part of ISO/IEC 23002, in order to confine its scope to the domain of decoder conformance specification.

Some allowances for modification of the specified accuracy requirements are made within this part of ISO/IEC 23002. Additional accuracy requirements that may be invoked by a referencing specification are specified in Annexes A and B.

2 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

2.1

array

indexed collection of scalar values

NOTE Square parentheses are used to indicate the indexing of arrays. For example, $s[5]$ denotes the entry at index 5 in the array s .

2.2

discrete cosine transform DCT

transformation that produces an output matrix of transform coefficients from an input matrix of samples using some approximation of the process specified in 5.1 or 5.2