INTERNATIONAL STANDARD

ISO/IEC 23008-5

First edition
2015-04-15

Information technology — High efficiency coding and media delivery in heterogeneous environments —

Part 5: Reference software for high efficiency video coding

Technologies de l'information — Codage à haute efficacité et livraison des médias dans des environnements hétérogènes —

Partie 5: Logiciel de référence pour le codage vidéo à haute efficacité

IECNORM.COM : Click to view the full PDF of ISO/IEC 23008-5:2015

Reference number
ISO/IEC 23008-5:2015(E)

© ISO/IEC 2015

IECNORM.COM : Click to view the full PDF of ISO/IEC 23008-5:2015

COPYRIGHT PROTECTED DOCUMENT

© ISO/IEC 2015

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

© ISO/IEC 2015 – All rights reserved

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 23008-5 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 29, *Coding of audio, picture, multimedia and hypermedia information*, in collaboration with ITU-T. The identical text is published as ITU-T H.265 (08/2014).

IECNORM.COM : Click to view the full PDF of ISO/IEC 23008-5:2015

© ISO/IEC 2015 – All rights reserved

Introduction*

This Recommendation | International Standard accompanies reference software for Rec. ITU-T H.265 | ISO/IEC 23008-2 High efficiency video coding. The reference software includes both encoder and decoder functionality.

Reference software is useful in aiding users of a video coding standard to establish and test conformance and interoperability, and to educate users and demonstrate the capabilities of the standard. For these purposes, the accompanying software is provided as an aid for the study and implementation of Rec. ITU-T H.265 | ISO/IEC 23008-2 High efficiency video coding.

The software has been jointly developed by the ITU-T Video Coding Experts Group (VCEG, Question 6 of ITU-T Study Group 16) and the ISO/IEC Moving Picture Experts Group (MPEG, Working Group 11 of Subcommittee 29 of ISO/IEC Joint Technical Committee 1).

0.1 Purpose

The purpose of this Recommendation | International Standard is to provide the following:

- Reference decoder software capable of decoding bitstreams that conform to Rec. ITU-T H.265 | ISO/IEC 23008-2 in a manner that conforms to the decoding process specified in Rec. ITU-T H.265 | ISO/IEC 23008-2.
- Reference encoder software capable of producing bitstreams that conform to Rec. ITU-T H.265 | ISO/IEC 23008-2.

0.2 Examples of use

Some examples of uses that may be appropriate for the reference decoder software are as follows:

- As an illustration of how to perform the decoding process specified in Rec. ITU-T H.265 | ISO/IEC 23008-2.
- As the starting basis for the implementation of a decoder that conforms to Rec. ITU-T H.265 | ISO/IEC 23008-2.
- For testing the conformance of a decoder implementation with the decoding process specified in Rec. ITU-T H.265 | ISO/IEC 23008-2 (as the values of the samples in all decoded pictures and the relative ordering of those pictures will be identical from all conforming decoder implementations that support the profile and level used in a bitstream that conforms to Rec. ITU-T H.265 | ISO/IEC 23008-2).
- For testing the conformance of a bitstream to the constraints specified for bitstream conformance in Rec. ITU-T H.265 | ISO/IEC 23008-2, as the software can detect and report many bitstream conformance violations.

  NOTE 1 – However, the lack of the detection of any conformance violation by the reference decoder software should not be considered as definitive proof that the bitstream conforms to all constraints specified for bitstream conformance in Rec. ITU-T H.265 | ISO/IEC 23008-2.

Some examples of uses that may be appropriate for the reference encoder software are as follows:

- As an illustration of how to perform an encoding process that produces bitstreams that conform to the constraints specified for bitstream conformance in Rec. ITU-T H.265 | ISO/IEC 23008-2.
- As the starting basis for the implementation of an encoder that conforms to Rec. ITU-T H.265 | ISO/IEC 23008-2.
- As a means of generating bitstreams for testing the conformance of a decoder implementation with the decoding process specified in Rec. ITU-T H.265 | ISO/IEC 23008-2.
- As a means of evaluating and demonstrating examples of the quality that can be achieved by an encoding process that conforms to Rec. ITU-T H.265 | ISO/IEC 23008-2.

  NOTE 2 – However, no guarantee of the quality that will be achieved by an encoder is provided by its conformance to Rec. ITU-T H.265 | ISO/IEC 23008-2, as the conformance of an encoder to Rec. ITU-T H.265 | ISO/IEC 23008-2 is defined only in terms of format constraints imposed on the bitstream syntax. Thus, while the reference encoder software may suffice to provide some illustrative examples of what quality can be achieved in conformance to Rec. ITU-T H.265 | ISO/IEC 23008-2, it provides neither an assurance of minimum guaranteed video encoding quality nor maximum achievable video encoding quality.

* This introduction does not form an integral part of this Recommendation | International Standard.

IECNORM.COM : Click to view the full PDF of ISO/IEC 23008-5:2015

© ISO/IEC 2015 – All rights reserved

0.3 Warranty disclaimer

Regardless of any and all statements made herein or elsewhere regarding the possible uses of the reference software, the following disclaimers of warranty apply to the provided reference software.

- ITU and ISO/IEC disclaim any and all warranties, whether express, implied, or statutory, including any implied warranties of merchantability or of fitness for a particular purpose.
- In no event shall the contributor(s), ISO/IEC or ITU be liable for any incidental, punitive, or consequential damages of any kind whatsoever arising from the use of these programs.
- This disclaimer of warranty extends to the user of these programs and user's customers, employees, agents, transferees, successors, and assignees.
- ITU does not represent or warrant that the programs furnished hereunder are free of infringement of any third-party patents.
- Commercial implementations of ISO/IEC International Standards | ITU-T Recommendations, including shareware, may be subject to royalty fees to patent holders.
- Information regarding the common patent policy for ITU-T/ITU-R/ISO/IEC is available from the ITU website at http://itu.int/ITU-T/dbase/patent/patent-policy.html.

IECNORM.COM : Click to view the full PDF of ISO/IEC 23008-5:2015

© ISO/IEC 2015 – All rights reserved

IECNORM.COM : Click to view the full PDF of ISO/IEC 23008-5:2015

Recommendation ITU-T H.265.2 | International Standard ISO/IEC 23008-5

Reference software for ITU-T H.265 | ISO/IEC 23008-2 High efficiency video coding

1 Scope

This Recommendation | International Standard provides accompanying reference software for Rec. ITU-T H.265 | ISO/IEC 23008-2 as an electronic attachment. The software is an integral part of this Recommendation | International Standard.

The use of this reference software is not required for making an implementation of an encoder or decoder in conformance to Rec. ITU-T H.265 | ISO/IEC 23008-2. Requirements established in Rec. ITU-T H.265 | ISO/IEC 23008-2 take precedence over the behaviour of the reference software.

2 References

2.1 Normative references

The following Recommendations and International Standards contain provisions which, through reference in this text, constitute provisions of this Recommendation | International Standard. At the time of publication, the editions indicated were valid. All Recommendations and Standards are subject to revision, and parties to agreements based on this Recommendation | International Standard are encouraged to investigate the possibility of applying the most recent edition of the Recommendations and Standards listed below. Members of IEC and ISO maintain registers of currently valid International Standards. The Telecommunication Standardization Bureau of the ITU maintains a list of currently valid ITU-T Recommendations.

2.1.1 ITU-T Recommendations | International Standards

– Recommendation ITU-T H.265 (2013), *High efficiency video coding for generic audiovisual services.*

– ISO/IEC 23008-2:2013, Information technology – High efficiency coding and media delivery in heterogeneous environments – Part 2: High efficiency video coding.

2.1.2 Identical Recommendations | International Standards

– None.

2.1.3 Paired Recommendations | International Standards equivalent in technical content

– Recommendation ITU-T H.265.2, *Reference software for ITU-T H.265 high efficiency video coding*

2.2 Additional references

– None.

IECNORM.COM : Click to view the full PDF of ISO/IEC 23008-5:2015

3 Definitions

For the purposes of this Recommendation, the terms, definitions, abbreviations and symbols specified in Rec. ITU-T H.265 | ISO/IEC 23008-2 (particularly in clause 3) apply. Definitions 3.1, 3.2, and 3.3 below replace the corresponding definitions in Rec. ITU-T H.265 | ISO/IEC 23008-2. Definitions 3.4 and 3.5 are additional definitions.

3.1 bitstream: A sequence of bits that may conform to Rec. ITU-T H.265 | ISO/IEC 23008-2. A bitstream that conforms to Rec. ITU-T H.265 | ISO/IEC 23008-2 will contain one or more slices.

3.2 decoder: An embodiment of a process that operates on a bitstream and may conform to the decoding process requirements specified for conformance to Rec. ITU-T H.265 | ISO/IEC 23008-2. The scope of

© ISO/IEC 2015 – All rights reserved

decoder, as considered herein, does not include a display process, which is outside the scope of this Recommendation | International Standard.

3.3 encoder: An embodiment of a process, not specified in this Recommendation | International Standard, that produces a bitstream.

3.4 reference software decoder: The decoding software accompanying this Recommendation | International Standard.

3.5 reference software encoder: The encoding software accompanying this Recommendation | International Standard.

4 Abbreviations

For the purposes of this Recommendation | International Standard, relevant abbreviations are specified in clause 4 of Rec. ITU-T H.265 | ISO/IEC 23008-2.

5 Conventions

For the purposes of this Recommendation | International Standard, relevant conventions are specified in clause 5 of Rec. ITU-T H.265 | ISO/IEC 23008-2.

6 Reference software for Rec. ITU-T H.265 | ISO/IEC 23008-2

The reference software for Rec. ITU-T H.265 | ISO/IEC 23008-2 is found in the electronic attachment to this Recommendation | International Standard.

The attached software package contains one part:

– HM software: Support for the Main, Main 10, and Main Still Picture profiles.

IECNORM.COM : Click to view the full PDF of ISO/IEC 23008-5:2015

© ISO/IEC 2015 – All rights reserved