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SERIES T: TERMINALS FOR TELEMATIC SERVICES
Still-image compression | JPEG XR

Information technology – JPEG XR image-coding system – Reference software

Recommendation ITU-T T.835

ITU-T

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Information technology – JPEG XR image-coding system – Reference software

Summary

Recommendation ITU-T T.835 is developed jointly with ISO/IEC JTC 1 SC 29/WG 1 in a collaborative team that is referred to as the Joint Photographic Experts Group (JPEG). It is published as a technically aligned twin text by both organizations (ITU-T and ISO/IEC).

This Recommendation | International Standard provides a reference software for Rec. ITU-T T.832 | ISO/IEC 29199-2 (*Information technology – JPEG XR image coding system – Image coding specification*) as an electronic attachment. The reference software is an integral part of this Recommendation | International Standard.

Reference software is useful in aiding users of an image-coding standard to establish and test conformance and interoperability, and to educate users and demonstrate the capabilities of the associated standard. For these purposes, the accompanying software is provided as an aid for the study and implementation of Rec. ITU-T T.832 | ISO/IEC 29199-2 technology. The reference software includes both encoder and decoder functionality. The reference decoder software is capable of decoding codestreams (or files) that conform to Rec. ITU-T T.832 | ISO/IEC 29199-2 in a manner that conforms to the decoding process specified in Rec. ITU-T T.832 | ISO/IEC 29199-2. The sample encoder software is capable of producing codestreams (or files) that conform to Rec. ITU-T T.832 | ISO/IEC 29199-2.

This third edition (08/2016) modifies the software to improve support for handling an order swapping of the red and blue channels in codestreams for the 555/565/101010 pixel formats. It also adds support for the box-based format of JPEG XR that is specified in Rec. ITU-T T.801 | ISO/IEC 15444-2 (JPEG 2000 Part 2). Some additional bug fixes are also included in the updated software.

This Recommendation | International Standard includes a normative electronic attachment containing a reference ANSI C source code.

History

Edition	Recommendation	Approval	Study Group	Unique ID*
1.0	ITU-T T.835	2010-01-13	16	11.1002/1000/10649
1.1	ITU-T T.835 (2010) Cor. 1	2011-06-13	16	11.1002/1000/11318
2.0	ITU-T T.835	2012-01-13	16	11.1002/1000/11472
3.0	ITU-T T.835	2016-08-13	16	11.1002/1000/12960

* To access the Recommendation, type the URL <http://handle.itu.int/> in the address field of your web browser, followed by the Recommendation's unique ID. For example, <http://handle.itu.int/11.1002/1000/11830-en>.

FOREWORD

The International Telecommunication Union (ITU) is the United Nations specialized agency in the field of telecommunications, information and communication technologies (ICTs). The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of ITU. ITU-T is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis.

The World Telecommunication Standardization Assembly (WTSA), which meets every four years, establishes the topics for study by the ITU-T study groups which, in turn, produce Recommendations on these topics.

The approval of ITU-T Recommendations is covered by the procedure laid down in WTSA Resolution 1.

In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC.

NOTE

In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

Compliance with this Recommendation is voluntary. However, the Recommendation may contain certain mandatory provisions (to ensure, e.g., interoperability or applicability) and compliance with the Recommendation is achieved when all of these mandatory provisions are met. The words "shall" or some other obligatory language such as "must" and the negative equivalents are used to express requirements. The use of such words does not suggest that compliance with the Recommendation is required of any party.

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As of the date of approval of this Recommendation, ITU had received notice of intellectual property, protected by patents, which may be required to implement this Recommendation. However, implementers are cautioned that this may not represent the latest information and are therefore strongly urged to consult the TSB patent database at <http://www.itu.int/ITU-T/ipr/>.

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Electronic attachment: Reference ANSI C source code

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Introduction

This Recommendation | International Standard has been developed by ITU-T and ISO/IEC in a collaborative team that is referred to as the Joint Photographic Experts Group (JPEG). It is published as a technically aligned twin text by both organizations (ITU-T and ISO/IEC).

This Recommendation | International Standard provides a reference software for Rec. ITU-T T.832 | ISO/IEC 29199-2 (*Information technology – JPEG XR image coding system – Image coding specification*) as an electronic attachment. The reference software is an integral part of this Recommendation | International Standard.

Reference software is useful in aiding users of an image-coding standard to establish and test conformance and interoperability, and to educate users and demonstrate the capabilities of the associated standard. For these purposes, the accompanying software is provided as an aid for the study and implementation of Rec. ITU-T T.832 | ISO/IEC 29199-2 technology. The reference software includes both encoder and decoder functionality.

0.1 Purpose

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

- Reference decoder software capable of decoding codestreams (or files) that conform to Rec. ITU-T T.832 | ISO/IEC 29199-2 in a manner that conforms to the decoding process specified in Rec. ITU-T T.832 | ISO/IEC 29199-2.
- Sample encoder software capable of producing codestreams (or files) that conform to Rec. ITU-T T.832 | ISO/IEC 29199-2.

The use of this reference software is not required for making an implementation of an encoder or decoder in conformance to Rec. ITU-T T.832 | ISO/IEC 29199-2. Requirements established in Rec. ITU-T T.832 | ISO/IEC 29199-2 take precedence over the behaviour of the reference software.

0.2 Examples of use

Some examples of uses for the reference decoder software are as follows:

- As an illustration of how to perform the decoding process specified in Rec. ITU-T T.832 | ISO/IEC 29199-2.
- As the starting basis for the implementation of a decoder that conforms to Rec. ITU-T T.832 | ISO/IEC 29199-2.
- For testing the conformance of a decoder implementation with the decoding process specified in Rec. ITU-T T.832 | ISO/IEC 29199-2 (as the values of the samples in all decoded pictures will be identical from all conforming decoder implementations that support the profile and level used in a codestream that conforms to Rec. ITU-T T.832 | ISO/IEC 29199-2, with limited allowances for colour sampling format conversions as specified in Rec. ITU-T T.832 | ISO/IEC 29199-2).
- For (non-exhaustive) testing of the conformance of a codestream (or file) to the constraints specified for codestream (or file) conformance in Rec. ITU-T T.832 | ISO/IEC 29199-2, as the software can detect and report many codestream 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 codestream (or file) conforms to all constraints specified for conformance in Rec. ITU-T T.832 | ISO/IEC 29199-2.

Some examples of uses for the sample encoder software are as follows:

- As an illustration of how to perform an encoding process that produces codestreams (or files) that conform to the constraints specified for codestream (or file) conformance in Rec. ITU-T T.832 | ISO/IEC 29199-2.
- As the starting basis for the implementation of an encoder that conforms to Rec. ITU-T T.832 | ISO/IEC 29199-2.
- As a means of generating codestreams (or files) for testing the conformance of a decoder implementation with the decoding process specified in Rec. ITU-T T.832 | ISO/IEC 29199-2.
- As a means of demonstrating and evaluating examples of the quality that can be achieved by an encoding process that conforms to Rec. ITU-T T.832 | ISO/IEC 29199-2.

NOTE 2 – However, no guarantee of the quality that will be achieved by an encoder is provided by its conformance to Rec. ITU-T T.832 | ISO/IEC 29199-2, as the conformance of an encoder to Rec. ITU-T T.832 | ISO/IEC 29199-2 is defined only in terms of specified constraints imposed on the syntax of the output of the encoder. In particular, while the sample encoder software may suffice to provide some illustrative examples of what quality can be achieved in conformance to Rec. ITU-T T.832 | ISO/IEC 29199-2, it provides neither an assurance of minimum guaranteed image encoding quality nor maximum achievable image encoding quality.