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Information technology — Scalable compression and coding of continuous-tone still images —

Part 5: Reference software

Technologies de l'information — Compression échelonnable et codage d'images plates en ton continu —

Partie 5: Logiciel de référence

Reference number
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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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

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For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 29, *Coding of audio, picture, multimedia and hypermedia information*.

A list of all parts in the ISO/IEC 18477 series can be found on the ISO website.

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Introduction

ISO/IEC 18477, also known under the name "JPEG XT", is a series of extensions of ISO/IEC 18477-1, a compression system for continuous tone digital still images which is backwards compatible with Rec. ITU-T T.81 | ISO/IEC 10918-1. That is, legacy applications conforming to Rec. ITU-T T.81 | ISO/IEC 10918-1 will be able to reconstruct streams generated by an encoder conforming to the ISO/IEC 18477 series, though will possibly not be able to reconstruct such streams in full dynamic range, full quality or other features defined in the ISO/IEC 18477 series.

This document offers implementations of various parts of the ISO/IEC 18477 standard that demonstrate the features and capabilities of JPEG XT. Its purpose is to act as a guideline for implementations and as a reference for conformance testing. As such, the implementations are conforming to the part of Rec. ITU-T T.81 | ISO/IEC 10918-1 that has been standardized as ISO/IEC 18477-1, i.e. it implements the baseline, extended sequential and progressive Huffman coding modes of the legacy standard together with common extensions such as Rec. ITU-T T.871 | ISO/IEC 10918-5, commonly known as JFIF. In addition, the reference software implementations also cover all other parts of the ISO/IEC 18477 standard, i.e., IDR coding, HDR coding, lossless and near-lossless coding and coding of alpha channels.

This document includes the source code for reference implementations of the ISO/IEC 18477 series of standards, available at http://standards.iso.org/iso-iec/18477/-5/ed-1/en. They have been successfully complied and tested on Linux[1)] and Windows™[2)] operating systems at the time of writing.

Note that ISO/IEC 18477-1 does not include the arithmetic coding modes, the hierarchical coding modes and the lossless coding modes of Rec. ITU-T T.81 | ISO/IEC 10918-1.

1) Linux is an example of a suitable product available commercially. This information is given for the convenience of users of this document and does not constitute an endorsement by ISO or IEC of this product.

2) Windows is an example of a suitable product available commercially. This information is given for the convenience of users of this document and does not constitute an endorsement by ISO or IEC of this product.

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Information technology — Scalable compression and coding of continuous-tone still images —

Part 5:
Reference software

1 Scope

This document provides reference implementations of multiple parts of the ISO/IEC 18477 series, also known under the name "JPEG XT". JPEG XT is designed primarily for compression of continuous-tone photographic content.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/IEC 18477-1, *Information technology — Scalable compression and coding of continuous-tone still images — Part 1: Scalable compression and coding of continuous-tone still images*

ISO/IEC 18477-3, *Information technology — Scalable compression and coding of continuous-tone still images — Part 3: Box file format*

ISO/IEC 18477-6, *Information technology — Scalable compression and coding of continuous-tone still images — Part 6: IDR Integer Coding*

ISO/IEC 18477-7, *Information technology — Scalable compression and coding of continuous-tone still images — Part 7: HDR Floating-Point Coding*

ISO/IEC 18477-8, *Information technology — Scalable compression and coding of continuous-tone still images — Part 8: Lossless and near-lossless coding*

ISO/IEC 18477-9, *Information technology — Scalable compression and coding of continuous-tone still images — Part 9: Alpha channel coding*

3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— IEC Electropedia: available at http://www.electropedia.org/

— ISO Online browsing platform: available at http://www.iso.org/obp

3.1
codestream
sequence of bytes that conforms to or is to be checked for conformance with the codestream syntax specified in ISO/IEC 18477-1 and/or ISO/IEC 18477-3

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3.2
decoder
embodiment of the decoding process specified in the ISO/IEC 18477 series or a process embodiment that is to be tested for conformance to the ISO/IEC 18477 series

3.3
encoder
process that produces *codestreams* (3.1) that conform to ISO/IEC 18477-1 or ISO/IEC 18477-3 or that are to be tested for conformance to the ISO/IEC 18477 series

3.4
pfm format
format similar to *ppm* (3.6) for carrying floating-point based colour images

Note 1 to entry: It is further specified in ISO/IEC 18477-4.

3.5
pnm format
superset of the *pfm* (3.4) and *ppm format* (3.6)

3.6
ppm format
portable pixmap format for carrying three-component integer sample based colour images specified in ISO/IEC 18477-4

4 Abbreviated terms

HDR high dynamic range

IDR intermediate dynamic range

LDR low dynamic range

PPM portable pixmap format

PFM portable floating-point format

TMO tone mapping operator

5 Conventions

5.1 Conformance language

This document consists of normative and informative text.

Normative text is that text which expresses mandatory requirements. The word "shall" is used to express mandatory requirements strictly to be followed in order to conform to this document and from which no deviation is permitted. A conforming implementation is one that fulfils all mandatory requirements.

Informative text is text that is potentially helpful to the user, but not indispensable and can be removed, changed or added editorially without affecting interoperability. All text in document is normative, with the following exceptions: the Introduction, any parts of the text that are explicitly labelled as "informative" and statements appearing with the preamble "NOTE" and behaviour described using the word "should". The word "should" is used to describe behaviour that is encouraged but is not required for conformance to this document.

The keywords "may" and "need not" indicate a course of action that is permissible in a conforming implementation.

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