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~~Coding of Still Pictures~~

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~~Joint Bi-level Image Experts Group~~ ~~Joint Photographic Experts Group~~

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~~Part 1: Core coding system specification~~

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

Part 1:
Core coding system specification

Technologies de l'information — Compression échelonnable et codage d'images plates en ton continu —~~Partie 1: titre manque~~

Partie 1: Spécification du système de codage de noyau

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Foreword

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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 or www.iec.ch/members_experts/refdocs).

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

This third edition cancels and replaces the second edition (ISO/IEC 18477-1:2020), which has been technically revised.

The main changes are as follows:

— the marker ID for the component decorrelation control marker was corrected.

~~— minor editorial changes throughout~~

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

and IEC websites.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at ~~www.iso.org/members.html and www.iec.ch/national-committees~~www.iso.org/members.html and www.iec.ch/national-committees.

Introduction

This document specifies a coded codestream format for storage of continuous-tone photographic content. JPEG XT is a scalable image coding system that builds on the legacy Rec. ITU-T T.81 | ISO/IEC 10918-1 coding system, also known as JPEG, but extends it in a backwards compatible way. This document specifies the commonly deployed components of the JPEG coding system. Additional parts of the ISO/IEC 18477 series extend on this baseline.

JPEG XT has been designed to be backwards compatible to legacy applications while at the same time having a small coding complexity; JPEG XT uses, whenever possible, functional blocks of Rec. ITU-T T.81 | ISO/IEC 10918-1, Rec. ITU-T T.86 | ISO/IEC 10918-4 and Rec. ITU-T T.871 | ISO/IEC 10918-5 to extend the functionality of the legacy JPEG coding system. It is optimized for good image quality and compression efficiency while also enabling low-complexity encoding and decoding implementations.

Information technology — Scalable compression and coding of continuous-tone still images — Part 1: Core coding system specification

Part 1: Core coding system specification

1 Scope

This document specifies a coding format, referred to as JPEG XT, which is designed primarily for continuous-tone photographic content. This document defines the core coding system, which forms the basis for the entire ISO/IEC 18477 series.

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.

Rec. ITU-T T.81 | ISO/IEC 10918-1:1994, *Information technology — Digital compression and coding of continuous-tone still images — Part 1: Requirements and guidelines*

Rec. ITU-T T.86 | ISO/IEC 10918-4, *Information technology — Digital compression and coding of continuous-tone still images — Part 4: Registration of JPEG profiles, SPIFF profiles, SPIFF tags, SPIFF colour spaces, APPn markers, SPIFF compression types and Registration Authorities (REGAUT)*

Rec. ITU-T T.871 | ISO/IEC 10918-5, *Information technology — Digital compression and coding of continuous-tone still images — Part 5: JPEG File Interchange Format (JFIF)*

3 Terms and definitions

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

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

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

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

3.1
bitstream
partially encoded or decoded sequence of bits comprising an entropy-coded segment

3.2
block
8×8 array of samples or an 8×8 array of DCT coefficient values of one component

3.3
byte
group of 8 bits

3.4
coder
embodiment of a coding process

3.5
coding
encoding or decoding

3.6
compression
reduction in the number of bits used to represent source image data

3.7
component
two-dimensional array of samples having the same designation in the output or display device

Note 1 to entry: An image typically consists of several components, e.g. red, green and blue.

3.8
continuous-tone image
image whose components have more than one bit per sample

3.9
discrete cosine transform
DCT
either the forward discrete cosine transform or the inverse discrete cosine transform

3.10
downsampling
procedure by which the spatial resolution of a component is reduced

3.11
entropy-coded data segment
independently decodable sequence of entropy encoded bytes of compressed image data

3.12
marker
two-byte code in which the first byte is hexadecimal FF and the second byte is a value between 1 and hexadecimal FE

3.13
marker segment
marker and associated set of parameters

3.14
precision
number of bits allocated to a particular sample or DCT coefficient