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Information technology — JPEG Pleno Plenoptic image coding system —

Part 1: Framework

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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).

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Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

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 21794 series can be found on the ISO website.

Introduction

This document is part of a series of standards belonging to the JPEG Pleno framework. This standard framework facilitates the capture, representation, exchange and visualization of point cloud, light field, and holographic imaging modalities. It specifies tools for coding these modalities while providing advanced functionality at system level such as support for data and metadata manipulation, editing, random access and interaction, protection of privacy and ownership rights.

This document specifies the JPEG Pleno Framework architecture and its instantiation via a generic file format for storage of plenoptic modalities as well as associated metadata descriptors.

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Information technology — JPEG Pleno Plenoptic image coding system — Part 1: Framework

1 Scope

This document specifies the JPEG Pleno Framework architecture and its instantiation via a generic file format for storage of plenoptic modalities as well as associated metadata descriptors.

2 Normative references

The following International Standards contain provisions which, through reference in this text, constitute provisions of this document. At the time of publication, the editions indicated were valid.

All Standards are subject to revision, and parties to agreements based on this document are encouraged to investigate the possibility of applying the most recent edition of the Standards listed below. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies. Members of IEC and ISO maintain registers of currently valid International Standards.

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.

ISO/IEC 15444-1, *Information technology — JPEG 2000 image coding system: Core coding system*

ISO/IEC 15444-2, *Information technology — JPEG 2000 image coding system: Extensions*

IEEE 754, *IEEE Standard for Floating-Point Arithmetic*

ISO/IEC 646, *Information technology -- ISO 7-bit coded character set for information interchange*

3 Terms and definitions

For the purposes of this document the terms, definitions, and abbreviated terms given in ISO/IEC 21794-1, and the following apply.

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

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

3.1

big-endian

byte ordering for which the most significant byte and least significant byte are sequentially ordered from lower memory address to higher memory address, respectively

3.2

bit

binary choice encoded as either 0 or 1

3.3

box

structured collection of data describing the image or the image decoding process

3.4

box contents

refers to the data wrapped within the box structure

3.5

box type

specifies the kind of information that shall be stored with the box

3.6

byte

group of 8 bits (octet)

coder

embodiment of a coding process

3.7

codestream

coded data representation that includes all necessary data to allow a (full or approximate) reconstruction of the sample values of a digital image

3.8

coding

encoding or decoding

3.9

coding process

general term for referring to an encoding process, a decoding process, or both

3.10

complex wavefront

wavefront represented with a complex representation, which can be for example real-imaginary or amplitude-phase

3.11

component

two-dimensional array of samples having the same designation in the output or display device, e. g. red, green or blue

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3.12**decoder**

embodiment of a decoding process

3.13**decoding process**

process that takes as its input coded image data and outputs a continuous-tone image

3.14**encoder**

embodiment of an encoding process

3.15**encoding process**

process that takes as its input a continuous-tone image and outputs coded image data

3.16**hologram**

sampled representation of the plenoptic function in the form of a complex wavefront

3.17**holographic display**

three-dimensional display that renders a complex optical wavefront

3.18**JPL**

still image file format with JPEG Pleno coded images

3.19**light field**

sampled representation of the plenoptic function in the form of a vector function that represents the radiance of a discretized set of light rays

3.20**light field data**

recorded light field

3.21**metadata**

type of data that provides additional information about the encoded data

3.22**plenoptic function**

radiance in time and in space obtained by positioning a pinhole camera at every viewpoint in 3D spatial coordinates, every viewing angle and every wavelength, resulting in a 7D representation

3.23**plenoptic data**

sampled representation of the plenoptic function (e.g. light field, point cloud, holographic representation)