DRAFT INTERNATIONAL STANDARD

ISO/IEC DIS 21794-1

ISO/IEC JTC **1**/SC **29** Secretariat: **JISC**

Voting begins on:
2019-10-28

Voting terminates on:
2020-01-20

Information technology — JPEG Pleno Plenoptic image coding system —

Part 1:
Framework

ICS: 35.040.30

This document is circulated as received from the committee secretariat.

Reference number
ISO/IEC DIS 21794-1:2019(E)

COPYRIGHT PROTECTED DOCUMENT

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Fax: +41 22 749 09 47
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

Page

Figures

Page

Tables

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).

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.

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

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)