INTERNATIONAL STANDARD

ISO/IEC 21794-2

First edition
2021-04

Information technology — Plenoptic image coding system (JPEG Pleno) —

Part 2: Light field coding

Technologies de l'information — Système de codage d'images plénoptiques (JPEG Pleno) —

Partie 2: Codages des champs de lumière

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Reference number
ISO/IEC 21794-2:2021(E)

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Published in Switzerland

Contents

Page

Foreword ... **iv**
Introduction ... **v**
1 Scope ... **1**
2 Normative references ... **1**
3 Terms and definitions ... **1**
4 Symbols and abbreviated terms ... **3**
4.1 Symbols ... 3
4.2 Abbreviated terms ... 7
5 Conventions ... **8**
5.1 Naming conventions for numerical values ... 8
5.2 Operators ... 8
5.2.1 Arithmetic operators ... 8
5.2.2 Logical operators ... 9
5.2.3 Relational operators ... 9
5.2.4 Precedence order of operators ... 9
5.2.5 Mathematical functions ... 10
6 General ... **10**
6.1 Functional overview on the decoding process ... 10
6.2 Encoder requirements ... 11
6.3 Decoder requirements ... 11
7 Organization of the document ... **11**
Annex A (normative) **JPEG Pleno Light Field superbox** ... **12**
Annex B (normative) **4D transform mode** ... **29**
Annex C (normative) **JPEG Pleno light field reference view decoding** ... **73**
Annex D (normative) **JPEG Pleno light field normalized disparity view decoding** ... **81**
Annex E (normative) **JPEG Pleno Light Field Intermediate View superbox** ... **89**
Bibiliography ... **117**

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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.

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

For an explanation of 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 www.iso.org/iso/foreword.html. In the IEC, see www.iec.ch/understanding-standards.

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*.

A list of all parts in the ISO/IEC 21794 series can be found on the ISO website.

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.

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Introduction

This document is part of a series of standards for a system known as JPEG Pleno. This document defines the JPEG Pleno framework. It facilitates the capture, representation, exchange and visualization of plenoptic imaging modalities. A plenoptic image modality can be a light field, point cloud or hologram, which are sampled representations of the plenoptic function in the form of, respectively, a vector function that represents the radiance of a discretized set of light rays, a collection of points with position and attribute information, or a complex wavefront. The plenoptic function describes the 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 function.

JPEG Pleno 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.

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Information technology — Plenoptic image coding system (JPEG Pleno) —

Part 2: Light field coding

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1 Scope

This document specifies a coded codestream format for storage of light field modalities as well as associated metadata descriptors that are light field modality specific. This document also provides information on the encoding tools.

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.

ITU-T Rec. T.800 | ISO/IEC 15444-1, *Information technology — JPEG 2000 image coding system — Part 1: Core coding system*

ITU-T Rec. T.801 | ISO/IEC 15444-2, *Information technology — JPEG 2000 image coding system — Part 2: Extensions*

ISO/IEC 21794-1:2020, *Information technology — Plenoptic image coding system (JPEG Pleno) — Part 1: Framework*

ISO/IEC 60559, *Information technology — Microprocessor Systems — Floating-Point arithmetic*

3 Terms and definitions

For the purposes of this document the terms and definitions 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
arithmetic coder
entropy coder that converts variable length strings to variable length codes (encoding) and vice versa (decoding)

3.2
bit-plane
two-dimensional array of bits

3.3
4D bit-plane
four-dimensional array of bits

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