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

Part 4: Reference software

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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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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 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.

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Introduction

This document is part of a series of standards for a system known as JPEG Pleno. The ISO/IEC 21794 series aims to provide a standard framework for representing new imaging modalities. 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 is designed primarily to facilitate the capture, representation, exchange and visualization of point cloud, light field, and holographic imaging approaches. It specifies tools for coding these approaches while providing advanced functionality at the system level such as support for data and metadata manipulation, editing, random access and interaction, protection of privacy and ownership rights as well as other security mechanisms.

This document provides reference software implementations of ISO/IEC 21794-1 and ISO/IEC 21794-2 that demonstrate the features and capabilities of JPEG Pleno for coding light field data. Its purpose is to act as a guideline for implementations and as a reference for conformance testing. As such, the implementations are conforming to ISO/IEC 21794-1, i.e. it implements the structure of a JPL file which includes the concepts of boxes. In addition, the reference software implementations also cover ISO/IEC 21794-2, i.e. light-field coding.

This document includes the source code for reference implementations of ISO/IEC 21794-1 and ISO/IEC 21794-2 as electronic attachments. They have been successfully compiled and tested on Linux®[1)] operating system at the time of writing.

Instructions for unpacking and building the software are found in Annexes A. Instructions for its use are listed in Annexes B and C.

1) Linux® is the trademark of a product supplied by Linus Torvalds. This information is given for the convenience of users of this document and does not constitute an endorsement by ISO/IEC of the product named. Equivalent products may be used if they can be shown to lead to the same results.

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

Part 4: Reference software

1 Scope

This document provides reference implementations of ISO/IEC 21794-1 and ISO/IEC 21794-2, also known as JPEG Pleno.

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

ISO/IEC 21794-2, *Information technology — Plenoptic image coding system (JPEG Pleno) — Part 2: Light field coding*

ISO/IEC 21794-3, *Information technology — Plenoptic image coding system (JPEG Pleno) — Part 3: Conformance testing*

3 Terms and definitions

For the purposes of this document the terms and definitions given in ISO/IEC 21794-1, in ISO/IEC 21794-2, in ISO/IEC 21794-3, and the following 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
codestream
sequence of bytes that conforms to or is to be checked for conformance with the codestream syntax specified in ISO/IEC 21794-1 and/or ISO/IEC 21794-2

3.2
JSON
data interchange format that represents data objects using attribute–value pairs and array data types specified in ISO/IEC 21778

4 Abbreviated terms

JPLM JPEG Pleno Model

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