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Partie 22: Format pour application à images multiples (MIAF)

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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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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 second edition cancels and replaces the first edition (ISO/IEC 23000-22:2019), which has been technically revised. It also incorporates the Amendments ISO/IEC 23000-22:2019/Amd 1:2021 and ISO/IEC 23000-22:2019/Amd 2:2021.

The main changes are as follows:

— additional adjustments on chroma subsampling.

A list of all parts in the ISO/IEC 23000 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.

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Introduction

This document specifies a multimedia application format, the Multi-Image Application Format (MIAF), that enables precise interoperability points for creation, reading, parsing, and decoding of images embedded in the High Efficiency Image File (HEIF) format. This document (MIAF) fully conforms to the HEIF format and only defines additional constraints to ensure higher interoperability.

ISO/IEC 23008-12 (HEIF) defines a file format for the inclusion of one or more images, possibly with one or more sequences of images, with associated metadata and their relationship to each other. While the HEIF specification defines the file format and general requirements for the included coding formats, it does not define specific interoperability points by which capturing devices, editing applications, storage systems, cloud and delivery networks, and playback devices and applications can interoperate with each other.

This document, by defining specific constraints on the HEIF format, limiting the supported encoding types to a set of specific profiles and levels, requiring specific metadata formats, and defining a set of brands for signalling such constraints, defines precise interoperability points which enable the industry to deploy particular uses of the HEIF specification to improve interoperability.

This document defines the normative requirements for MIAF files as well as for MIAF readers and renderers.

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Information technology — Multimedia application format (MPEG-A) —

Part 22: Multi-image application format (MIAF)

1 Scope

This document specifies the Multi-Image Application Format (MIAF), which contains coded images, groups and sequences of images along with their metadata and the information about their relations to each other, all embedded in the High Efficiency Image File (HEIF) format.

This document builds on ISO/IEC 23008-12 (HEIF) and specifies the following:

— a set of additional constraints on ISO/IEC 23008-12 (HEIF), to simplify its file format options;

— specific alpha plane formats;

— a set of specific profiles and levels for the supported coding formats;

— a set of specific metadata formats;

— a set of brands, including application brands indicating conformance with specific profiles;

— a set of rules for extending MIAF format to support additional coding formats, profiles, levels and metadata.

This document also defines the normative behaviour for a MIAF reader and MIAF renderer.

This document (MIAF) is intentionally written to be extensible, and to allow for forward compatibility. The format is also permissive of the presence of other data, such as coding formats, metadata, and derived images.

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 14496-3, *Information technology — Coding of audio-visual objects — Part 3: Audio*

Rec. ITU-T H.264 | ISO/IEC 14496-10, *Information technology — Coding of audio-visual objects — Advanced video coding*

ISO/IEC 14496-12, *Information technology — Coding of audio-visual objects — Part 12: ISO base media file format*

ISO/IEC 14496-15, *Information technology — Coding of audio-visual objects — Part 15: Carriage of network abstraction layer (NAL) unit structured video in the ISO base media file format*

Rec. ITU-T T.802 | ISO/IEC 15444-3, *Information technology — JPEG 2000 image coding system — Part 3: Motion JPEG 2000*

ISO 16684-1, *Graphic technology — Extensible metadata platform (XMP) — Part 1: Data model, serialization and core properties*

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ISO/IEC 23000-19, *Information technology — Multimedia application format (MPEG-A) — Part 19: Common media application format (CMAF) for segmented media*

ISO/IEC 23001-14, *Information technology — MPEG systems technologies — Part 14: Partial file format*

Rec. ITU-T H.265 | ISO/IEC 23008-2, *Information technology — High efficiency coding and media delivery in heterogeneous environments — High efficiency video coding*

ISO/IEC 23008-12, *Information technology — High efficiency coding and media delivery in heterogeneous environments — Part 12: Image File Format*

JEITA CP-3451, *Exchangeable image file format for digital still cameras*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in Rec. ITU-T H.264 | ISO/IEC 14496-10, ISO/IEC 14496-12, Rec. ITU-T H.265 | ISO/IEC 23008-2, ISO/IEC 23008-12 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
alpha plane
image specifying the transparency information of the master image

Note 1 to entry: When the resolution of an alpha plane differs from that of the master image, MIAF renderers are expected to rescale the alpha plane to the resolution of the master image, but the rescaling operation is not specified exactly and thus the exact behaviour of different MIAF renderer implementations can differ.

3.2
depth map
image that contains information relating to the distance of the surfaces of scene objects from a viewpoint

3.3
MIAF application brand
brand indicating that a *MIAF file* (3.5) conforms to additional requirements that apply to all *MIAF profiles* (3.8) and that *MIAF readers* (3.9) and *MIAF renderers* (3.12) that implement these requirements may process the MIAF file

3.4
MIAF auxiliary image item
image item that provides auxiliary visual information but is not normally independently rendered

Note 1 to entry: The requirements are in subclause 7.3.5.

3.5
MIAF file
file containing one or more image and/or image sequence and/or video tracks

Note 1 to entry: A MIAF file is constrained to conform to clause 7.

3.6
MIAF master image item
image item that may be rendered

3.7
MIAF image item
MIAF master image item (3.6), *MIAF auxiliary image item* (3.4) or *MIAF thumbnail image item* (3.10)

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