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Information technology — Coded representation of immersive media —

Part 21: Reference software for Geometry-based Point Cloud Compression (G-PCC)

Technologies de l'information — Représentation codée de média immersifs —

Partie 21: Logiciel de référence pour la compression des nuages de points basée sur la géométrie (G-PCC)

Reference number
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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 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*.

A list of all parts in the ISO/IEC 23090 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.

Introduction

Reference software is useful in aiding users of a coding standard to establish and test conformance and interoperability, and to educate users and demonstrate the capabilities of the standard. For these purposes, the accompanying software is provided as an aid for the study and implementation of ISO/IEC 23090-9 for Geometry-based Point Cloud Compression (G-PCC).

Source code is available at https://standards.iso.org/iso-iec/23090/-21/ed-1/en/. The reference software includes both encoder and decoder functionality.

Warranty disclaimer

Regardless of any and all statements made herein or elsewhere regarding the possible uses of the reference software, the following disclaimers of warranty apply to the provided reference software.

— ISO/IEC disclaim any and all warranties, whether express, implied, or statutory, including any implied warranties of merchantability or of fitness for a particular purpose.

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Information technology — Coded representation of immersive media —

Part 21: Reference software for Geometry-based Point Cloud Compression (G-PCC)

1 Scope

This document provides accompanying reference software for ISO/IEC 23090-9.

The use of this reference software is not required for making an implementation of an encoder or decoder in conformance to ISO/IEC 23090-9. Requirements established in ISO/IEC 23090-9 take precedence over the behaviour of the reference software.

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 23090-9:2021, *Information technology — Coded Representation of Immersive Media — Part 9: Geometry-based Point Cloud Compression (G-PCC)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/IEC 23090-9 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
decoder
embodiment of a process that operates on a bitstream and may conform to the decoding process requirements specified for conformance to ISO/IEC 23090-9

Note 1 to entry: The scope of decoder, as considered herein, does not include a display process, which is outside the scope of this document.

3.2
encoder
embodiment of a process that produces a bitstream

4 Conventions

For the purposes of this document, relevant conventions are specified in ISO/IEC 23090-9.

5 Reference software for ISO/IEC 23090-9

The reference software for ISO/IEC 23090-9 is downloadable from https://standards.iso.org/iso-iec/23090/-21/ed-1/en/.

The attached software package contains one part:

— mpeg-pcc-tmc13 software: Support for the Simple, Predictive, Dense, and Main profiles.

6 Examples of use

6.1 Decoder software

Some examples of uses that may be appropriate for the reference decoder software are as follows:

— As an illustration of how to perform the decoding process specified in ISO/IEC 23090-9.

— As the starting basis for the implementation of a decoder that conforms to ISO/IEC 23090-9.

— For testing the conformance of a decoder implementation with the decoding process specified in ISO/IEC 23090-9 (as the values of the samples in all decoded point cloud frames and the relative ordering of those point cloud frames will be identical from all conforming decoder implementations that support the profile and level used in a bitstream that conforms to ISO/IEC 23090-9).

— For testing the conformance of a bitstream to the constraints specified for bitstream conformance in ISO/IEC 23090-9, as the software can detect and report many bitstream conformance violations.

The lack of the detection of any conformance violation by the reference decoder software should not be considered as definitive proof that the bitstream conforms to all constraints specified for bitstream conformance in ISO/IEC 23090-9.

6.2 Encoder software

Some examples of uses that may be appropriate for the reference encoder software are as follows:

— As an illustration of how to perform an encoding process that produces bitstreams that conform to the constraints specified for bitstream conformance in ISO/IEC 23090-9.

— As the starting basis for the implementation of an encoder that conforms to ISO/IEC 23090-9.

— As a means of generating bitstreams for testing the conformance of a decoder implementation with the decoding process specified in ISO/IEC 23090-9.

— As a means of evaluating and demonstrating examples of the quality that can be achieved by an encoding process that conforms to ISO/IEC 23090-9.

However, no guarantee of the quality that will be achieved by an encoder is provided by its conformance to ISO/IEC 23090-9, as the conformance of an encoder to ISO/IEC 23090-9 is defined only in terms of format constraints imposed on the bitstream syntax. Thus, while the reference encoder software may suffice to provide some illustrative examples of what quality can be achieved in conformance to ISO/IEC 23090-9, it provides neither an assurance of minimum guaranteed encoding quality nor maximum achievable encoding quality.