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NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 44115.2-2024

Information technology - Virtual reality content representation - Part 2: Video

信息技术 虚拟现实内容表达 第2部分：视频

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Standardization Administration of the PRC

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Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for standardization work Part

1.Structure and drafting rules for standardization documents" Drafting. This document is Part 2 of GB/T 44115 "Information Technology Virtual Reality Content Expression". GB/T 44115 has been published in Lower part.

2.Video. This document was proposed and coordinated by the National Technical Committee for Information Technology Standardization (SAC/TC28). This document was drafted by: Peking University Shenzhen Graduate School, Pengcheng Laboratory, Peking University, University of Science and Technology of China, Alibaba (China) Co., Ltd., Beijing University of Posts and Telecommunications, MediaTek Bodong Technology (Beijing) Co.,

Ltd., Migu Video Technology Co., Ltd., Shanghai University, Beijing Samsung Communications Technology Research Co., Ltd., Shenzhen DJI Innovations Technology Co., Ltd., Huawei Technologies Co., Ltd., Shenzhen Immersive Vision Technology Co., Ltd. Company, Hangzhou Hikvision Digital Technology Co., Ltd., Tencent Technology (Shenzhen) Co., Ltd., Zhejiang University, Beijing Lanting Digital Technology Co., Ltd. Ltd., Hisense Group Holdings Co., Ltd., China Electronics Technology Standardization Institute, Guangdong Bohua Ultra High Definition Innovation Center Co., Ltd., Zhongguancun Audiovisual Industry Technology Innovation Alliance. The main drafters of this document are. Wang Ronggang, Gao Wen, Wu Feng, Huang Tiejun, Sheng Xiaojie, Zheng Xiaozhen, Cai Yangang, Zhao Haiwu, Yang Haitao, Wang Yueming, Lin Jianliang, Chen Jie, Wang Zhenyu, Wang Rongjie, Gu Song, Qiu Ke, Liu Xiangning, Lai Yawen, Wang Qi, Wu Xiaoyang, Tian Jun, Yu Lu, Liu Dong, Sun Wenbo, Zhang Xinggong, Chen Weiqiang, Gao Xuesong, Wang Guozhong, Zhang Weimin, Li Jingxin, Zhao Haiying.

GB/T 44115 aims to establish video and audio specifications applicable to virtual reality and is intended to consist of three parts.

1.System. The purpose is to establish the transmission format and signaling format of efficiently coded virtual reality video and audio data.

2.Video. The purpose is to establish the coding representation and reconstruction methods of virtual reality panoramic video and free viewpoint video.

3.Audio. The purpose is to determine the expression of immersive audio content in virtual reality devices and related systems, including Including metadata structure and renderer system architecture and interface specifications. The issuing authority of this document calls attention to the fact that when declaring compliance with this document, it may involve 6.1, 6.3, 6.3.4, 6.3.7, 6.3.7, 7.1, 7.2.2, The following 27 patents related to the expression of virtual reality content are used in 7.3, 7.3.3, 7.3.4, and 7.3.5.The patent names are as follows: 202110172711.7, Virtual viewpoint synthesis method, device, electronic device and storage medium; 202010853410.6, Virtual viewpoint synthesis Method, device, electronic device and readable storage medium; 202010853423.3, Virtual viewpoint synthesis method, device, electronic device and readable storage medium Medium;.201610888835.4, A panoramic video data processing method, device and system;.201710081731.7, Image processing method, device Device and machine-readable medium;.201910172742.5, Multi-angle free viewpoint data processing method and device, medium, terminal, equipment; 201910173414.7, Multi-angle free-viewing angle video data processing method, device, medium, and equipment;.201911032857.0, Virtual viewpoint map Image generation method, system, electronic device and storage medium;.201710726197.0, Pyramid model processing method and device, image encoding method Method and device;201910172743.x,Multi-angle free viewpoint image data generation method and device, medium, equipment;201910172727.0,Multi Angle free viewpoint video data generation method and device, medium, and server;.201910173413.2, Multi-angle free

viewpoint image data processing Method, device, medium, and equipment;.201910172717.7, video reconstruction method, system, equipment, and computer-readable storage medium; 201910172720.9, Image reconstruction method, system, device and computer readable storage medium; 202010630754.0, Free viewpoint video reconstruction Construction method and playback processing method, device and storage medium; 202010762409.2, video processing method, device, electronic device and storage medium; 202010740742.3, Depth map correction, video processing, video reconstruction method and related device; 202010748734.3, Video decoding method, system System, device and computer readable storage medium;.201610945845.7, Description method and encoding method of the region of interest of panoramic video; 201610543056.0,Panoramic image mapping method;.201710116888.9,Panoramic image mapping method;.201610035874.x,Based on multi- Panoramic video encoding and decoding method and device with border filling;.201710037483.6, Asymmetric mapping method for panoramic images; 201710031017.7, Panoramic video mapping method based on main viewpoint;.201910240995.1, A coding and decoding method based on free viewpoint and device;201811339349.2,A DIBR free viewpoint synthesis method for low-quality depth maps;201710882161.1,Based on the main Panoramic video mapping method of viewpoints. The issuing organization of this document takes no position on the authenticity, validity and scope of this patent. The patent holder has promised to the issuing agency of this document that he is willing to cooperate with any applicant under reasonable and non-discriminatory terms and conditions. The patent holder's statement has been filed with the issuing agency of this document, and relevant information can be obtained through Get in touch with. Contact. Huang Tiejun (Secretary General of Digital Audio and Video Codec Technical Standards Working Group) Correspondence address. Room 2641, Science Building 2, Peking University, No.

5 Yiheyuan Road, Haidian District, Beijing Postal Code.100871 Email. tjhuang@pku.edu.cn Tel. 8610-62756172 Fax. 8610-62751638 Please note that in addition to the above patents, some of the contents of this document may still involve patents. The issuing agency of this document does not assume the responsibility for identifying patents. responsibility. Information technology Virtual reality Content expression Part

1 Scope

GB/T 44115.2-2024 specifies how video is represented in virtual reality content in the Chinese VR standards series, the companion to Part 3 on audio. Panoramic video is not ordinary video with a wider field: the sphere has to be projected onto a rectangle to be coded at all, the projection introduces distortion that varies with latitude, only the part the viewer is looking at needs full quality, and the picture has to respond to head movement within a few milliseconds. This document defines the representation that carries all of that: the conventions and the notation used through the specification, and then the coded representation and reconstruction of panoramic video, covering the video source and the

standard framework, the syntax and semantics of the representation, and the reconstruction method by which a decoder rebuilds the sphere. For a VR platform, a headset maker, a camera or stitching vendor or a content producer working to Chinese requirements, this is the governing text.

This document specifies the coding representation and reconstruction method of virtual reality panoramic video and free viewpoint video, including the syntax and semantics of the compressed domain. and the reconstruction process, and the interface with the planar video coding standard. This document is applicable to applications such as virtual reality video content production, broadcasting, and transmission.

2 Normative references

The contents of the following documents constitute the essential clauses of this document through normative references in this document. For referenced documents without a date, only the version corresponding to that date applies to this document; for referenced documents without a date, the latest version (including all amendments) applies to This document.

GB/T 20090.2-2013 Information technology advanced audio and video coding Part

3 Terms and definitions

The terms and definitions defined in GB/T 33475.2-2024 and the following apply to this document.

3.1 reserved Some specific syntax element values.

Note. For future extension of this document. [Source: GB/T 33475.2-2024, 3.2]

3.2 encodingprocess The process of producing a bitstream conforming to this document.

3.3 encoder The entity that completes the encoding process.

10 Advanced video coding ISO /

IEC 23008-2.2023/ITU-TH.265 Efficient coding and media transmission in heterogeneous information technology environments Part 2 ISO /

IEC 23090-3.2022/ITU-TH.266 Information technology - Coded representation of immersive media - Part