# INTERNATIONAL ORGANIZATION FOR STANDARDIZATION

# ORGANISATION INTERNATIONALE DE NORMALISATION

# ISO/IEC/JTC 1/SC 29/WG 11

# CODING OF MOVING PICTURES AND AUDIO

**ISO/IEC JTC 1/SC 29/WG 11 N16923**

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**Evidence of New Developments in Video Compression Coding**

Turin, Italy – The 119th MPEG meeting was held in Turin, Italy, from 17 – 21 July 2017

**Evidence of New Developments in Video Compression Coding**

Following a “Call for Evidence” (CfE) issued by MPEG jointly with ITU-T Q6/16 VCEG, evidence was evaluated at the 119th MPEG meeting to show that video coding technology has been developed with a compression capability that significantly exceeds that of the HEVC standard and its current extensions.

The Call for Evidence requested responses for use cases of video coding technology in three categories: standard dynamic range (SDR), high dynamic range (HDR), and 360° omnidirectional video. The evaluation of the responses included subjective testing of the video quality produced by candidate video coding technology. Two responses were received in the SDR category, two responses in the HDR category, and four in the 360° category. Additionally, the performance of the “Joint Exploration Model” (JEM) reference design that has been developed collaboratively in the MPEG-VCEG Joint Video Exploration Team (JVET) was also evaluated.

The results indicate that for a considerable number of test cases, significant gain over HEVC had been demonstrated, with comparable subjective quality at 40-50% less bit rate compared to HEVC for the SDR and HDR test cases. In single cases, even higher rate savings could be observed. Substantial benefit was also shown for several 360° video test cases. It has thus been concluded that evidence exists of compression technology that may significantly outperform HEVC that could be used to develop a new standard. As a consequence, preparations have proceeded toward issuing a formal Call for Proposals (expected to be issued in October 2017), with responses expected to be evaluated at the MPEG meeting in April 2018.

**Call for Evidence on Transcoding for Network Distributed Video Coding**

A “Call for Evidence on Transcoding for Network Distributed Video Coding” was issued at the 119th MPEG meeting as document N17058. It is addressed to interested parties that have technology providing transcoding of video at lower computational complexity than transcoding done using a full re-encode. The call asks for video transcoding technology suitable for adaptive bitrate streaming applications where a highest bit rate stream is transcoded into lower bit rate streams. Responses to the call are expected to use “side streams” that accompanies the highest bit rate stream to assist the transcoding process. Submissions are expected for the 120th MPEG meeting where their compression efficiency and computational complexity will be assessed.

**2nd Edition of Storage of Sample Variants reaches Committee Draft**

At its 119th meeting, MPEG has reached the first milestone of developing the 2nd edition of storage of sample variants, ISO/IEC 23001-12. Sample variants are typically used to provide forensic information in the rendered sample data that can, for example, identify the specific Digital Rights Management (DRM) client which has decrypted the content. This variant framework is intended to be fully compatible with Common Encryption (CENC), as specified by ISO/IEC 23001-7, and agnostic to the particular forensic marking system used. The first edition of this standard has only specified its use in the ISO base media file format (ISOBMFF) but the 2nd edition will expand its usage to MPEG-2 transport stream (M2TS) as well. Additionally, for that purpose a new amendment to MPEG-2 Systems, ISO/IEC 13818-1 AMD 10, has been also initiated.

**New Technical Report on Signalling, Backward Compatibility and Display Adaptation for HDR/WCG Video Coding**

At the 119th MPEG meeting, work was completed on a technical report for high dynamic range (HDR) and wide colour gamut (WCG) video distribution, based on the High Efficiency Video Coding (HEVC) standard, and when applicable on the Advanced Video Coding (AVC) standard, using either single-layer or dual-layer coding. The new technical report complements the material provided in the recently developed Technical Report entitled Conversion and Coding Practices for HDR/WCG Y'CbCr 4:2:0 Video with PQ Transfer Characteristics, and serves several purposes.

The new report provides a survey of the signalling mechanisms handling HDR/WCG video. It includes guidance on the processing and coding of HDR/WCG video in several types of colour representations. It discusses approaches to enable compatibility with legacy decoding systems that do not have the ability to detect and properly display HDR/WCG video content. It describes methods for adapting HDR/WCG video content for use with display technology having different degrees and types of dynamic range and colour gamut capability. A dual-layer coding approach using the Scalable Main 10 profile of HEVC for backward compatibility with standard dynamic range (SDR) systems is also documented.

**Draft Requirements for Hybrid Natural/Synthetic Scene Data Container**

At its 119th meeting, MPEG has issued Draft Requirements to develop a standard to define a scene representation media container suitable for interchange of content for authoring and rendering rich immersive experiences. The objective of the potential new standard to be called Hybrid Natural/Synthetic Scene (HNSS) data container, is to define a scene graph data representation and the associated container for media that can be rendered to deliver photorealistic hybrid scenes, including scenes that obey the natural flows of light, energy propagation and physical kinematic operations. The container will support various types of media that can be rendered together, including volumetric media that is computer generated or captured from the real world.

**How to contact MPEG, learn more, and find other MPEG facts**

To learn about [MPEG basics](http://mpeg.chiariglione.org/mpeg-basics), discover [how to participate](http://mpeg.chiariglione.org/who-we-are) in the committee, or find out more about the array of technologies developed or currently under development by MPEG, visit MPEG’s home page at <http://mpeg.chiariglione.org/>. There you will find information publicly available from MPEG experts past and present including tutorials, white papers, vision documents, and requirements under consideration for new standards efforts. You can also find useful information in many public documents by using the search window including publicly available output documents of each meeting (note: some may have editing periods and in case of questions please contact Dr. Christian Timmerer).

Examples of tutorials that can be found there include tutorials for: High Efficiency Video Coding, Advanced Audio Coding, Universal Speech and Audio Coding, and DASH to name a few. A rich repository of white papers can also be found and continues to grow. You can find these papers and tutorials for many of [MPEG’s standards](http://mpeg.chiariglione.org/standards) freely available. Press releases from previous MPEG meetings are also available. Journalists that wish to receive MPEG Press Releases by email should contact Dr. Christian Timmerer at christian.timmerer@itec.uni-klu.ac.at or christian.timmerer@bitmovin.com.

**Further Information**

Future MPEG meetings are planned as follows:

No. 120, Macau, CN, 23 – 27 October 2017

No. 121, Gwangju, KR, 22 – 26 January 2018

No. 122, San Diego, US, 16 – 20 April 2018

No. 123, Ljubljana, SI, 16 – 20, July 2018

For further information about MPEG, please contact:

Dr. Leonardo Chiariglione (Convenor of MPEG, Italy)

Via Borgionera, 103

I-10040 Villar Dora (TO), Italy

Tel: +39 011 935 04 61

leonardo@chiariglione.org

or

Priv.-Doz. Dr. Christian Timmerer

Alpen-Adria-Universität Klagenfurt | Bitmovin Inc.

9020 Klagenfurt am Wörthersee, Austria, Europe

Tel: +43 463 2700 3621

Email: christian.timmerer@itec.aau.at | christian.timmerer@bitmovin.com