# 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 N15328**

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# Evidence motivates MPEG to launch new standardization effort for HDR

Warsaw, PL − The 112th MPEG meeting was held in Warsaw, PL, from 22 – 26 June, 2015

**MPEG takes next steps to enhance HEVC Main10 for HDR/WCG**

MPEG is pleased to announce it has initiated a standardization effort to enhance the coding performance of the HEVC Main 10 profile for High Dynamic Range/Wide Colour Gamut (HDR/WCG) video. This work follows positive results from the multiple responses to MPEG’s Call for Evidence (CfE) on HDR/WCG. These results show that several proponents have demonstrated significant gains, allowing MPEG to launch a rapid-track effort to address current industry needs.

In parallel to its rapid-track effort, MPEG plans to launch a second track to address long-term requirements that may include even further improved compression of HDR/WCG content. This second effort could be part of a larger future video compression effort within MPEG. A formal Call for Proposals for the second track is expected to be issued later, possibly in 2017.

**Seminar on the Future of Video Coding Standardization planned for 113th MPEG meeting**

MPEG recognizes that video consumption and the deployment of video-related applications continues to surge, and hence, that there is a need to begin exploring technologies and requirements for future video coding standardization. Therefore MPEG will hold a public seminar on the Future of Video Coding Standardization on the 21st of October 2015 during its 113th meeting in Geneva. The purpose of this seminar is to examine new technologies and application areas that are relevant for future video coding. Invited speakers will discuss:

* Objective metrics for video quality evaluation
* Dedicated compression technologies for new types of content (e.g. game streaming)
* Compression technologies suitable for specific applications (e.g., multiple-stream representations, energy-saving encoders/decoder, aerial video)
* New capturing devices and their applications

The seminar is open to the public and [registration](mailto:marco.mattavelli@epfl.ch) is free of charge. Everyone is invited to attend to learn more about future video coding challenges and to contribute to the discussion on the next steps towards a new video coding standard.

Other logistic information on the 113th MPEG meeting is available [online](http://mpeg.chiariglione.org/meetings/113) together with [the detailed program of the Seminar](http://mpeg.chiariglione.org/meetings/113/w15347.zip).

**MPEG progresses Phase 2 for MPEG-H 3D Audio**

At the 112th MPEG meeting, Phase 2 for MPEG-H 3D Audio has reached its first formal milestone by progressing to the status of Preliminary Draft Amendment (PDAM). Phase 2 incorporates technology that further increases the coding efficiency of MPEG-H 3D Audio and adds features that will be of great use to the broadcast industry such as: advanced loudness control, layered coding for Higher Order Ambisonic (HOA)-based content, and the ability to interoperate with ITU-R standardized BW64 (Broadcast WAV 64) and ADM (Audio Definition Model) metadata. Key compression technologies focus on achieving intermediate bit rates of 128 kb/s to 256 kb/s for immersive signals.

**MPEG issues Call for Proposals for Compact Descriptors for Video Analysis**

At the 112th MPEG meeting, MPEG has issued a Call for Proposals (CfP) on Compact Descriptors for Video Analysis (CDVA). This CfP addresses compact (i.e., compressed) video description technologies for search and retrieval applications, i.e. for visual content matching in video. Visual content matching includes matching of views of large and small objects and scenes, that is robust to partial occlusions as well as changes in vantage point, camera parameters, and lighting conditions. The objects of interest comprise planar or non-planar, rigid or partially rigid, textured or partially textured objects. CDVA aims to enable efficient and interoperable design of video analysis applications in large databases, for example broadcasters' archives or videos available on the Internet. It is envisioned that CDVA will provide a complementary set of tools to the suite of existing MPEG standards, such as the MPEG-7 Compact Descriptors for Visual Search (CDVS). Responses to the CDVA CfP will be evaluated on the weekend prior to the 114th MPEG meeting in February 2016 (San Diego, USA).

**Call for Evidence issued for Free-Viewpoint Television: Super-Multiview and Free Navigation**

At its 112th meeting, MPEG has issued a Call for Evidence (CfE) on Free Viewpoint Television (FTV): Super-Multiview and Free Navigation. FTV is the ultimate 3DTV, providing arbitrarily selected views for a very realistic, glasses-free 3-D viewing without eye fatigue. With FTV, users can view a scene by freely changing their viewpoint just as they naturally do in the real world.

MPEG selected two challenging application scenarios for FTV: Super-Multiview and Free Navigation. For the Super-Multiview scenario, the CfE calls for new tools to efficiently encode hundreds of linearly or angularly arranged, horizontal parallax, ultra-dense views for Super-Multiview glasses-free 3D displays. For the Free Navigation scenario, the CfE calls for new tools to generate additional high-quality views, in the decoder, which are not present in the encoded bitstream. Responses to the CfE will be evaluated during the 114th MPEG meeting in San Diego.

Detailed information, including how to respond to the CfE, will soon be available as documents N15348 and N15349 at: <http://mpeg.chiariglione.org/meetings/112>.

**New application format to link media objects reaches CD stage**

At its 112th meeting, MPEG has reached the first milestone to define a new application format that enables the linking of a video program that is being watched to external interactive media elements such as web pages, images, audio clips, different types of video (2D, multi-view, with depth information, free viewpoint) and synthetic 3D models. This new format will be useful to implement applications that are designed to link any object from the video to other videos regarding the same object. This application format will use the MPEG-21 Digital Item as a container format for the media data, and eXtensible MPEG-4 Textual format (XMT) as an authoring format for the layout of the media data.

**Pattern-based 3D mesh coding reaches FDAM status**

Pattern-Based 3D Mesh Coding (PB3DMC), to be published as ISO/IEC 14496‑16:2011/Amd, 4, i.e., the 4th Amendment of the 4th Edition of MPEG‑4 Part 16, Animation Framework eXtension (AFX), has reached Final Draft Amendment (FDAM) status at the 112th MPEG meeting. PB3DMC is an efficient compression algorithm for multi-connected 3D models, that exploits the redundancy caused by the presence of repetitive structures, regardless of their various positions, orientations or scaling factors. Any detected repetitive structure is modelled in a “pattern + instances” fashion: the “pattern” being the representative shape of the structure, and the “instances” being all of its connected components. These components are then coded by their common pattern ID and their own transformation (reflection, translation, rotation and scaling) with respect to the pattern. PB3DMC yields a significant compression gain compared to the previous algorithms in MPEG’s Scalable Complexity 3D Mesh Coding (SC3DMC) toolset, in particular, when models present repetitive features.

**MPEG advances state-of-the-art carriage of media in latest file format developments**

MPEG is pleased to announce the imminent availability of a new integrated edition of the ISO Base Media File Format (ISO/IEC 14496-12, also available as ISO/IEC 15444-12). This file format is the basis for several heavily used standards in the industry, including most notably MP4, and has been in continuous development for 15 years. This new edition incorporates several recent amendments, and also contains corrections and re-structuring for improved readability. Important material in those incorporated amendments includes support for MPEG Dynamic Range Control.

In the area of content protection, MPEG has a new edition of the important Common Encryption specification (ISO/IEC 23001-7). This new edition re-organizes the document for improved flow, and includes a new mode that allows content to be only partially encrypted even while fully protected, hence possibly providing important power savings to play the content. In addition, MPEG is publishing a specification of a technology, called Sample Variants (ISO/IEC 23001-12), that enables the insertion of watermarks as part of the decryption and playback of protected content.

At MPEG 112, the High Efficiency Image File format (HEIF, available as ISO/IEC 23008-12) is now also technically complete. This specification supports storage of one or more HEVC Images or Image Sequences, and permits documentation of the relationship between them, the indication of necessary transformation and composition, and associated metadata in various formats. The file format can also be adapted to carry images coded by a variety coding systems, and the protection of images. This capability thereby allows the packaging of images that form a collection, and the indication of non-destructive edits, and tiling.

HEIF follows other significant recent developments in the area of file format, including the support for the carriage of High Efficiency Video Coding (HEVC) in this file format family, and the carriage of Timed Text (specifically the formats based on W3C TTML, and W3C WebVTT). The latter provides important support for improved accessibility of multimedia.

**Internet Video Coding progresses to Committee Draft stage**

The Committee Draft of Internet Video Coding (IVC), ISO/IEC 14496-33, has been issued at the 112th meeting. IVC is a compression technology that has been developed in MPEG by combining well-known existing technology elements, such that a video codec could be licensed under 'Type 1' conditions (such conditions include being licensable worldwide under reasonable and non-discriminatory terms that are free of charge). IVC’s compression performance has been determined to be approximately equal to that of the AVC High Profile for typical operational settings, both for streaming and low-delay applications. It is believed that this standard can be highly beneficial for video services in the Internet domain.

**MPEG shows-off exciting applications for Compact Descriptors for Visual Search (CDVS)**

At its 112th meeting held in Warsaw, MPEG hosted an awareness event to highlight its recent CDVS standard (ISO/IEC 15938-13) and to demonstrate the deployment of new and exciting applications for CDVS, ranging from consumer to professional grade applications. Consumer applications demonstrated included mobile visual search apps: e.g., wine recognition/adviser, location recognition/adviser, and an application to instantly establish the physical location from a photo entitled “Where have I been in Warsaw?” The professional systems showed deployment of CDVS search in broadcast media postproduction, automated image/video classification tools for archives, and a Smart Factory maintenance tool that can recognize machine parts. Fast, real time implementation of CDVS on mobile phone GPU was also shown.

The CDVS standard specifies high-performance, low-complexity, compact descriptors from still images, enabling deployment in low-power handheld devices, transmission over congested networks, and the interoperable design of large-scale visual search applications. It was developed to respond to industry's need for a standardized solution to large-scale visual search ensuring interoperability of devices and applications.

The event was well attended by developers of visual search applications, multimedia device and sensor manufacturers, multimedia content creators and broadcasters.

**Verification tests demonstrate superior performance of HEVC for range extensions and interlace coding**

MPEG is proud to announce the completion of rigorous subjective verification testing for the format range extensions (RExt) of the High Efficiency Video Coding (HEVC, ISO/IEC 23008-2) standard and for the use of HEVC for the coding of interlaced video. The RExt testing used 10 bit 4:2:2 and 4:4:4 video formats. HEVC’s video coding capabilities for both RExt and interlaced video coding were tested against comparable uses of the prior AVC standard, and major benefits were shown for the new HEVC technology. The results show that even when HEVC is limited to only half the bit rate of AVC, HEVC generally achieves a better encoding quality than AVC for both interlace and format range extension content.

**Seminar for Genome Compression Standardization planned for the 113th MPEG meeting**

A public seminar on the Prospects on Genome Compression Standardization will be held on the 20th of October 2015 during the 113th MPEG meeting in Geneva. The purpose of this seminar is twofold: to raise the awareness on the need of new approaches to genome compression for the efficient handling of the increasing flood of sequencing data and to collect requirements from stakeholders from the different fields interested in the acquisition and processing of genome data.

The main topics covered by the seminar presentations will be:

* New approaches, tools and algorithms to compress genome sequence data
* Objectives and issues of quality scores compression and impact on downstream analysis applications
* New approaches to quality scores definition and processing
* Genome compression and genomic medicine applications

All interested parties are invited to join the seminar to learn more about genome data processing challenges and planned MPEG standardization activities in this area, share opinions, and work together towards the definition of standard technologies supporting improved storage, transport and new functionality for the processing of genomic information.

The seminar is open to the public and [registration](mailto:marco.mattavelli@epfl.ch) is free of charge.

Other logistic information on the 113th MPEG meeting are available [online](http://mpeg.chiariglione.org/meetings/113) together with [the detailed program of the Seminar](http://mpeg.chiariglione.org/meetings/113/w15347.zip).

**Digging Deeper – How to Contact MPEG, Tutorials, and other MPEG facts**

Communicating the large and sometimes complex array of technology that the MPEG Committee has developed is not a simple task. Experts, past and present, have contributed a series of tutorials and vision documents that explain each of these standards individually, and can be found on the MPEG homepage at <http://mpeg.chiariglione.org>. Examples of tutorials that can be found on the MPEG homepage include: High Efficiency Video Coding, Advanced Audio Coding, Universal Speech and Audio Coding, and DASH to name a few. This repository of resources continues to grow after each MPEG meeting. You can start your MPEG adventure at <http://mpeg.chiariglione.org/>

**Further Information**

Future MPEG meetings are planned as follows:

No. 113, Geneva, CH, 19 – 23 October 2015

No. 114, San Diego, CA, USA, 22 – 26 February 2016

No. 115, Geneva, CH, 30 – 03 May – June 2016

No. 116, Chengdu, CN, 17 – 21 October, 2016

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The MPEG homepage also has links to other MPEG pages that are maintained by the MPEG subgroups. It also contains links to public documents that are freely available for download by those who are not MPEG members. Journalists that wish to receive MPEG Press Releases by email should contact Dr. Arianne T. Hinds at [a.hinds@cablelabs.com](mailto:a.hinds@cablelabs.com)