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Coding of moving pictures and audio

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Email of convenor:	**leonardo@chiariglione.org**
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INTERNATIONAL ORGANISATION FOR STANDARDISATION
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ISO/IEC JTC 1/SC 29/WG 11
CODING OF MOVING PICTURES AND AUDIO

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Brussels, BE – January 2020

WG11 (MPEG) fosters Cloud-based Media Processing across Multiple Platforms

Brussels, Belgium – The 129th WG 11 (MPEG) meeting was held in Brussels, Belgium, 12-17 January 2020

Coded representation of immersive media – WG11 promotes Network-Based Media Processing (NBMP) to the final stage

At its 129th meeting, WG11 (MPEG) promoted ISO/IEC 23090-8, Network-Based Media Processing (NBMP), to Final Draft International Standard (FDIS). With the increasing complexity and sophistication of media services and the incurred media processing, offloading complex media processing operations to the cloud/network is becoming critically important in order to keep receiver hardware simple and power consumption low.

The NBMP standard defines a framework that allows content and service providers to *describe*, *deploy*, and *control* media processing for their content in the cloud by using libraries of pre-built 3rd party functions. The framework includes an abstraction layer to be deployed on top of existing commercial cloud platforms and is designed to be able to be integrated with 5G core and edge computing. The NBMP workflow manager is another essential part of the framework enabling composition of multiple media processing tasks to process incoming media and metadata from a media source and to produce processed media streams and metadata that are ready for distribution to media sinks.

Coded representation of immersive media – Publication of the Technical Report on Architectures for Immersive Media

At its 129th meeting, WG11 (MPEG) published an updated version of its technical report on architectures for immersive media. This technical report, which is the first part of the ISO/IEC 23090 (MPEG-I) suite of standards, introduces the different phases of MPEG-I standardization and gives an overview of the parts of the MPEG-I suite. It also documents use cases and defines architectural views on the compression and coded representation of elements of immersive experiences. Furthermore, it describes the coded representation of immersive media and the delivery of a full, individualized immersive media experience. MPEG-I enables scalable and efficient individual delivery as well as mass distribution, while adjusting to the rendering capabilities of consumption devices. Finally, this technical report

breaks down the elements that contribute to a fully immersive media experience and assigns quality requirements as well as quality and design objectives for those elements.

Genomic information representation – WG11 receives answers to the joint call for proposals on genomic annotations in conjunction with ISO TC 276/WG 5

The current ISO/IEC 23092 (MPEG-G) standard series addresses the representation, compression and transport of genome sequencing data. In particular, ISO/IEC 23092 provides a *file and transport format*, *compression technology*, *metadata specifications*, *protection support*, and *standard APIs* for the access of sequencing data in the native compressed format.

The effective association of sequencing data with the results of the analysis pipelines expressed by a rich variety of annotations, is still an open problem, not efficiently solved by current file formats or standards. As of today, separate complex post-processing steps need to be applied to possibly very large quantities of genomic sequencing data.

At its 127th meeting, WG11 (MPEG) and ISO TC 276/WG 5 issued a joint Call for Proposals (CfP) addressing the solution of such problem. Answers to the call have been received at the 129th MPEG meeting in Brussels. These proposals have individually shown to provide partial solutions to the problem. Thus, a set of core experiments have been defined so as to integrate the proposed technologies into a single standard specification capable of satisfying all identified requirements and supporting a rich variety of queries. The proposers are fully committed to collaborate for the development and validation of an integrated solution ready for the first standardization step (*i.e.,* Committee Draft) at the 131st MPEG meeting in June/July 2020.

Open font format – WG11 promotes Amendment of Open Font Format to the final stage

Realizing the importance of the text component in media, MPEG has been working on standardization of font formats, in particular ISO/IEC 14496-22 Open Font Format since 2004. The standard has been widely deployed and is supported by virtually all connected devices where text is displayed on screen. At the 129th meeting, WG11 (MPEG) promoted the first amendment of ISO/IEC 14496-22 4th edition to Final Draft Amendment. The 4th edition of the Open Font Format defines a set of technical tools that would be necessary to create fonts that support multiple different languages and writing systems. It enables different applications to reliably parse the font data that may be exchanged as part of the media content (*e.g.,* on the web). This amendment enhances the standard by improving the font tools that are needed to support complex requirements for text layout including specific font features that are designed to support the required functionality for vertical writing.

High efficiency coding and media delivery in heterogeneous environments – WG11 progresses Baseline Profile for MPEG-H 3D Audio

At the 129th meeting, WG11 (MPEG) promoted ISO/IEC 23008-3:2019, Amendment 2 to Draft Amendment status. The Amendment incorporates improvements and corrections on the second edition of MPEG-H 3D Audio standard and introduces a new profile called Baseline profile. The 3D Audio Baseline profile is a subset of the existing Low Complexity profile and

supports channel and object signals. It can be signaled in a backwards compatible fashion, enabling interoperability with devices implementing the 3D Audio Low Complexity profile.

The 3D Audio Baseline profile addresses industry demands and is tailored for *broadcast*, *streaming*, and *high-quality immersive music delivery* use cases. In addition to the advanced loudness and Dynamic Range Control (DRC) as well as interactivity and accessibility features supported in the 3D Audio standard, the Baseline profile enables the usage of up to 24 audio objects in Level 3 for high quality immersive music delivery.

Multimedia content description interface – Conformance and Reference Software for Compact Descriptors for Video Analysis promoted to the final stage

Managing and organizing the quickly increasing volume of video content is a challenge for many industry sectors, such as media and entertainment or surveillance. One example task is scalable instance search, *i.e.,* finding content containing a specific object instance or location in a very large video database. This requires video descriptors which can be efficiently extracted, stored, and matched. Standardization enables extracting interoperable descriptors on different devices and using software from different providers, so that only the compact descriptors instead of the much larger source videos can be exchanged for matching or querying. ISO/IEC 15938-15:2019 – the MPEG Compact Descriptors for Video Analysis (CDVA) standard – defines such descriptors. CDVA includes highly efficient descriptor components using features resulting from a Deep Neural Network (DNN) and uses predictive coding over video segments. The standard is being adopted by industry.

At its 129th meeting, WG11 (MPEG) has finalized the conformance guidelines and reference software. The software provides the functionality to extract, match, and index CDVA descriptors. For easy deployment, the reference software is also provided as Docker containers.

Additional Important Activities at the 129th WG 11 (MPEG) meeting

The 129th WG 11 (MPEG) meeting was attended by more than 500 experts from 25 countries working on important activities including *(i)* a scene description for MPEG media, *(ii)* the integration of Video-based Point Cloud Compression (V-PCC) and Immersive Video (MIV), *(iii)* Video Coding for Machines (VCM), and *(iv)* a draft call for proposals for MPEG-I Audio among others.

How to contact WG 11 (MPEG), learn more, and find other MPEG facts

To learn about MPEG basics, discover how to participate in the committee, or find out more about the array of technologies developed or currently under development by WG 11 (MPEG), visit WG 11 (MPEG)'s home page at https://mpeg.chiariglione.org/. There you will find information publicly available from WG 11 (MPEG) experts past and present including tutorials, white papers, vision documents, short articles 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 WG 11 (MPEG)'s standards freely available. Press releases from previous WG 11 (MPEG) meetings are also available.

Journalists that wish to receive WG 11 (MPEG) Press Releases by email should contact Dr. Christian Timmerer at christian.timmerer@itec.uni-klu.ac.at or christian.timmerer@bitmovin.com or subscribe via https://lists.aau.at/mailman/listinfo/mpeg-pr. For timely updates follow us on Twitter (https://twitter.com/mpeggroup).

Further Information

Future WG 11 (MPEG) meetings are planned as follows:
No. 130, Alpbach, AT, 20 – 24 April 2020
No. 131, Geneva, CH, 29 June – 03 July 2020
No. 132, Rennes, FR, 12 – 16 October 2020
No. 133, Capetown, ZA, 11 – 15 January 2021

For further information about WG 11 (MPEG), please contact:
Dr. Leonardo Chiariglione (Convenor of WG 11 (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