# 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 N17298**

**January 2018 – Gwangju, Korea**

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| Source: | Convenor of MPEG  |  |
| Status: | Approved by WG11 |
| Subject: | MPEG Press Release |
| Date: | 26 January 2018 |

**Compact Descriptors for Video Analysis (CDVA)
reaches Committee Draft level**

Gwangju, Korea – The 121st MPEG meeting was held in Gwangju, Korea, from 22 – 26 January 2018

**Compact Descriptors for Video Analysis (CDVA) reaches Committee Draft level**

At its 121st meeting, MPEG promoted CDVA (ISO/IEC 15938-15) to Committee Draft (CD) level – the first formal step of the ISO/IEC approval process for a new standard. This will become a new part of MPEG-7 to support video search and retrieval applications.

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. The CDVA standard will specify descriptors that fulfil these needs.

The specification includes the components of the CDVA descriptor, its bitstream representation and the extraction process. The standard will be complemented by conformance guidelines and reference software (ISO/IEC 15938-16). The final standard is expected to be finished in early 2019.

CDVA contains components that are compatible with CDVS (Compact Descriptors for Visual Search, ISO/IEC 15938-13), a standard for images with comparable functionalities, but also uses predictive coding over video segments (e.g., shots). Additionally, CDVA introduces a new descriptor based on features which are output from a Deep Neural Network (DNN). CDVA is robust against viewpoint changes and moderate transformations of the video (e.g., re-encoding, overlays), it supports partial matching and temporal localization of the matching content. The CDVA descriptor has a typical size of 2–4 KBytes per second of video. For typical test cases, it has been demonstrated to reach a correct matching rate of 88% (at 1% false matching rate).

**MPEG-G standards reach Committee Draft for metadata and APIs**

The availability of high-throughput deoxyribonucleic acid (DNA) sequencing technologies opens up new perspectives in the treatment of several diseases, making possible the introduction of new global approaches in public health known as “precision medicine”. While routine DNA sequencing in the doctor's office is still not current practice, medical centres have begun to use sequencing to identify cancer and other diseases and to find effective treatments. As DNA sequencing technologies produce extremely large amounts of DNA sequence data and related information, the ICT costs of storage, transmission, and processing are also very high. The MPEG-G standard addresses and solves the problem of efficient and economical handling of genomic data by providing not only new compression and transport technologies, but also a standard specification for associating relevant information in the form of metadata and APIs for building interoperable applications capable of manipulating MPEG-G files.

The different parts of the MPEG-G standard are the results of the synthesis of technologies collected in response to a Call for Proposals issued at MPEG’s 115th meeting in collaboration with the working group for standardization of data processing and integration of the ISO Technical Committee for biotechnology standards (ISO TC 276/WG 5).

At its 121st meeting, MPEG promoted its second set of specifications of the family of MPEG-G standards to Committee Draft (CD) level. Such part of the standard provides a new compression technology (ISO/IEC 23092-3) for associating relevant information to the genomic sequencing data and a set of APIs supporting rich functionality for the access and manipulation of genomic data by interoperable applications. Additional standardization plans for MPEG-G include the Committee Drafts for reference software (ISO/IEC 23092-4) and conformance (ISO/IEC 23092-4), which are planned to be issued at the next 122nd MPEG meeting with the objective of producing Draft International Standards (DIS) at the end of 2018.

**MPEG issues Calls for Visual Test Material for Immersive Applications**

After achieving the final stage of development for its Omnidirectional Media Format (OMAF) at its 120th meeting, MPEG is working on extending OMAF functionalities to allow the modification of viewing positions, e.g. in case of head movements when using a head-mounted display, or for use with other forms of interactive navigation. Unlike OMAF which only provides 3 degrees of freedom (3DoF) for the user to view the content from a perspective looking outwards from the original camera position, the anticipated extension will also support motion parallax within some limited range which is referred to as 3DoF+. In the future with further enhanced technologies, a full 6 degrees of freedom (6DoF) will be achieved with changes of viewing position over a much larger range. To develop technology in these domains, MPEG has issued two Calls for Test Material in the areas of 3DoF+ and 6DoF, asking owners of image and video material to provide such content for use in developing and testing candidate technologies for standardization.

**Internet of Media Things (IoMT) reaches Committee Draft level**

At its 121st meeting, MPEG issued a Committee Draft (CD) for the Internet of Media Things. With this IoMT CD, MPEG objective is to facilitate the large-scale deployment of distributed media systems with interoperable audio/visual data and metadata exchange. This standard specifies APIs providing Media Things (cameras/displays and microphones/loudspeakers, possibly capable of significant processing power) with the capability of being discovered, setting-up ad-hoc communication protocols, exposing usage conditions, and providing media and metadata as well as services processing them.

IoMT APIs encompass a large variety of devices, not just connected cameras and displays but also sophisticated devices such as smart glasses, image/speech analyzers and gesture recognizers. IoMT enables the expression of the economic value of resources (media and metadata) and of associated processing in terms of digital tokens leveraged by the use of blockchain technologies.

**MPEG finalizes its Media Orchestration (MORE) standard**

At its 121st meeting, MPEG promoted its “Media Orchestration” (MORE) standard to Final Draft International Standard (FDIS), the final stage of development. The specification supports the automated combination of multiple media sources (i.e., cameras, microphones) into a coherent multimedia experience. It also supports rendering multimedia experiences on multiple devices simultaneously, again giving a consistent and coherent experience. The MORE specification contains tools for orchestration in time (synchronization) and space.

MPEG expects that the Media Orchestration standard to be especially useful in immersive media settings. This applies notably in social virtual reality (VR) applications, where people share a VR experience and are able to communicate about it. Media Orchestration is expected to allow synchronising the media experience for all users, and to give them a spatially consistent experience as it is important for a social VR user to be able to understand when other users are looking at them. MPEG is now working on the reference software and conformance bitstream for MORE which would be available in 2019.

**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 <https://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. 122, San Diego, US, 16 – 20 April 2018

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

No. 124, Macau, CN, 08 – 12 October 2018

No. 125, Marrakech, MA, 14 – 18 January 2019

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