PRESS RELEASE

A New Language for VR Streaming: MPEG Technically Finalized First International Standard for VR Streaming

Virtual worlds are in high demand, whether in computer games or even in planning processes in the industry, as well as in streaming video services. The delivery and storage standard OMAF, developed by the MPEG Group, will ensure in the future that all VR devices speak the same language and are compatible with each other. The HEVC Tile Based Streaming Technology from Fraunhofer HHI will enable a significant increase in the resolution of 360-degree videos with OMAF. Thus, high-definition video footage is making its way into Virtual Reality.

A Babel-type language tangle can sometimes be rather entertaining – but only if you are on vacation, relaxing at a café, listening to conversations at the next table. If you are really interested in getting your content across, it will take much less effort if you and the other person speak the same language. This is not only true for people, technical devices and services should also understand each other and use a single language.

What the global language English is for human communication, for example, special standards are in the world of technology. The MPEG Group has now developed such a standard: "Omnidirectional Media Format", "OMAF" for short. It standardizes the delivery and storage of VR content, such as that of 360-degree videos, the way we can watch them on VR glasses.

The MPEG standardization committee is made up of representatives from all the industrial sectors having to do with Virtual Realities. Among those contributing their expertise to the project were also researchers from the Fraunhofer Heinrich Hertz Institute in Berlin: The technologies they introduced to the standard will help efficiently deliver high-resolution data to present and future devices. The trick: smartphones can display VR content with significantly higher quality if the user's line of vision is taken into account while the content is streamed. The OMAF standard was technically finalized at the last MPEG meeting in October and is expected to be published at the beginning of 2018.

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Consumers will benefit...

But why do we need a standard like this? For one thing, it is designed to make life easier for consumers – at least with regard to Virtual Reality. This is because the OMAF standard encourages offerings in the OMAF language. In other words, there are sure to be altogether more services being offered relating to all things VR. Since these services will all speak a single language, consumers will be able to use them right away. What is more, in the long run consumers will certainly not have to dig as deep into their pockets to be able to do so. The key point: thanks to a development provided by Fraunhofer HHI, the standard will enable a significant increase in the resolution of 360-degree videos.

… as much as the industry

The VR industry will also benefit from the new standard – ultimately, the trend in the industry is moving away from in-house solutions and toward joint solutions. The standard will create a solid basis for this: it will require the different devices to be compatible with each other. This will not only simplify the interaction between them, but also the design of the individual devices and solutions, which in turn will reduce the costs.

The OMAF standard that has been developed includes exact technical descriptions of how the media data must be formatted and how applications must be designed. Its wording is not particularly catchy, however – by nature, it does not answer any specific questions, for example about applications and uses of the standard. This is where the Virtual Reality Industry Forum (VRIF), which counts Fraunhofer – along with Intel, Qualcomm, Ericsson, Nokia, Dolby, Harmonic, Akamai, Sony, Huawei, Technicolor and others – as a founding member, takes over. The Industry Forum is developing guidelines for the OMAF standard, as well as best practice examples for industrial companies. The guidelines, to which the Fraunhofer HHI researchers have also significantly contributed and which are expected to be developed on an ongoing basis, cover the production of VR content as well as its distribution and use.

High resolution of 360-degree videos – even on mobile devices

One key aspect of the OMAF standard, especially of the VRIF guidelines: the resolution of 360-degree videos, the way we watch them with VR glasses for example, is expected to increase. So far, the resolution has been rather poor. The HEVC Tile Based Streaming Technology from Fraunhofer HHI is enabling a great leap forward in this respect. The trick: the entire 360-degree video is divided into "tiles" of the HEVC video coding standard, which are encoded independently of each other. Using these tiles, the device – such as the VR glasses – can assemble the image needed, with optimal resolution. In the user's line of vision, the image

is therefore of high definition; behind him, the resolution is low. So far, it has been necessary to have one video on the server for each viewing angle: an expensive affair. The HEVC Tile Based approach offers many benefits: resolution can be improved significantly – significantly less video data has to be stored on the servers – operating costs are reduced. With HEVC Tiles, ultra-high-resolution content can be optimally delivered to mobile devices, despite limited bandwidth and computing power.

Innovations for the digital society of the future are the focus of research and development work at the **Fraunhofer Heinrich Hertz Institute HHI**. In this area, Fraunhofer HHI is a world leader in the development for mobile and optical communication networks and systems as well as processing and coding of video signals. Together with international partners from research and industry, Fraunhofer HHI works in the whole spectrum of digital infrastructure – from fundamental research to the development of prototypes and solutions. www.hhi.fraunhofer.de