

PRESS RELEASE

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Virtual Reality: Tile Based HEVC Video – Enabler for high quality VR streaming from Fraunhofer HHI

High-resolution content is required to foster a sense of immersion in VR video applications, but the large amount of data poses a challenge to established transport means and the limits of video decoders. Lightweight merging of HEVC Tiles allows to easily adapt the 360 degree video data stream to the current VR user viewport without transcoding to significantly reduce the required data rates. At this year's trade fair IBC in Amsterdam the Fraunhofer HHI will show this technology (Hall 8, Booth B80).

High-resolution in user Field of View (FoV) is required to foster a sense of immersion in VR video applications such as multiple times UHD resolution to cover full 360 degree surroundings. This large amount of data poses a major challenge to the whole chain of current state video streaming. The bandwidth required for streaming of such content over the public Internet cannot be provided for most of users. Likewise, video decoders are typically not capable of decoding such high-resolution video, especially with constrained resources such as those of a mobile device.

A new approach for bitrate adaptively in Virtual Reality video applications is required. An inferior approach is to provide a stream per user or FoV orientation, which does not scale well and requires many separate encodings. A superior solution is facilitation of HEVC Tiles. After encoding, this approach allows emphasis of the current user FoV within the 360 degree video through better quality or higher resolution on-the-fly. This is done in a lightweight fashion without transcoding by Fraunhofer HHI's technique for aggregation of tiles of different quality or resolution into a single common bitstream.

Fraunhofer HHI's underlying technique for Compressed Domain Tile Aggregation allows aggregating separate HEVC encoded videos into a single common HEVC bitstream through lightweight rewriting of header information. Using this technique, a suitable bitstream for each user can be easily generated on the fly without heavy processing on the server or client side. This allows a more efficient bandwidth usage as video content outside the users current FoV can be transmitted with low quality or small resolution. Therefore, this technique

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enables a better decoder utilization such as 16K VR video quality using a 4K decoder.

Given Fraunhofer HHI's lightweight technique for Compressed Domain Tile Aggregation, usage of a single video decoder on the end device is enabled. Furthermore, complete and market ready streaming solutions can be implemented based on the well-established MPEG standards family such as MPEG File Format and MPEG DASH which are fully compatible to the Compressed Domain Tile Aggregation technique.

The **Fraunhofer Heinrich Hertz Institute** is a world leader in the development of mobile and fixed broadband communication networks and multimedia systems. From photonic components and systems through fiber optic sensor systems to video coding and transmission, the Fraunhofer HHI works together with its international partners from research and industry. www.hhi.fraunhofer.de

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