

FRAUNHOFER INSTITUTE FOR
INTEGRATED CIRCUITS IIS

FRAUNHOFER VR TECHNOLOGIES



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For decades Virtual Reality has been a figment of science fiction writers' imagination. Today it is the closest to true reality it has ever been. Fraunhofer develops VR technologies that provide a stunning level of realism and create the feeling of "being there".

VR Audio

Audio is an integral element of VR. The Audio and Media Technologies Division of Fraunhofer IIS provides technologies for the complete chain of immersive audio production and delivery for VR:

- Capturing: With a state-of-the-art microphone-processing, impressive immersive audio can now easily be recorded with built-in or external microphones of 360 cameras.
- Production: Fraunhofer IIS offers tools that simplify mixing of immersive audio content for VR and support audio objects, multichannel beds and ambisonic signals.
- Delivery: Audio codecs developed by Fraunhofer IIS allow for the delivery of surround or immersive sound of highest quality at very low bit-rates.
- Playback: Fraunhofer Cingo is the leading VR headphone playback solution for immersive audio content. Its extensive selection of features has convinced industry leaders such as Google, Samsung, LG and Alcatel to integrate Cingo into their products.

Holodeck 4.0

Located at Fraunhofer's one-of-a-kind L.I.N.K. Test and Application Center, the Holodeck 4.0 offers a variety of virtual worlds which are based on highly precise positioning technology and



are created with the help of the Unity 3D Gaming Engine. Up to 40,000 square meters of virtual space are available to be explored for the most diverse scenarios, including the application areas production and logistics, architecture, gaming as well as safety and security. Holodeck 4.0 users can move about freely. The system supports up to 100 transmitters, allowing multiple users to interact with each other and simultaneously discover the different virtual worlds.

VR Video

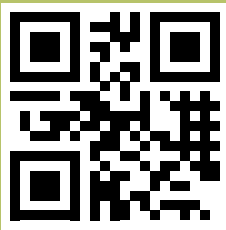
High resolution video content is crucial for a perfect VR experience. Fraunhofer HHI's OmniCam-360 is a multi-camera system that allows live recording of 360 degree panoramas and displaying the panoramic content on large screens, tablets and VR glasses in real-time. For efficient VR streaming or broadcasting services Fraunhofer HHI developed viewport adaptive solutions based on HEVC tiles that do not compromise the visual quality.

Light field for VR Applications

Moving around in VR worlds has so far only been possible in computer-generated environments. 360 degree panoramas captured from real scenes limit the viewpoint to a fixed position. Light field capturing and processing enable the user to change the perspective and viewpoint so that images from real environments can be used similar to computer-generated scenes.

The Moving Picture Technologies Department at Fraunhofer IIS provides software for light field computation that extends the usage of VR to real scenes.

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