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# FRAUNHOFER VR TECHNOLOGIES

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**Fraunhofer Institute for Integrated Circuits IIS**

Director
Prof. Dr.-Ing. Albert Heuberger

Am Wolfsmantel 33
91058 Erlangen, Germany

Contact
Matthias Rose
Phone +49 9131 776-6175
Fax +49 9131 776-6199
matthias.rose@iis.fraunhofer.de

www.iis.fraunhofer.de

# FRAUNHOFER VR TECHNOLOGIES

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 & Multimedia Division of Fraunhofer IIS provides technologies for the complete chain of immersive audio production and delivery for VR:

- Capturing: Thanks to a sophisticated microphone-processing algorithm developed by Fraunhofer IIS, impressive immersive audio can easily be recorded with built-in or external micro-phones of VR cameras.
- Production: Fraunhofer IIS offers tools that simplify mixing of 3D sound 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 and LG 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**

The visual element of a VR experience is the video content. Fraunhofer HHI developed a multi-camera system, the Omni-Cam-360, which allows a live video recording in 360 degree panoramic format. Supported by the Real Time Stitching Engine (RTSE) for color matching, warping, stitching and blending, the panoramic content can be displayed on tablets and VR-glasses in real-time.

**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.