



OmniCam-360

Acquisition of panoramic UHD video

Fraunhofer HHI has developed a set of scalable multi-camera systems that can be used for capturing high-resolution 2D and 3D video panoramas for immersive applications. Three different versions of the OmniCam-360 are equipped with either 10, 20 or 24 Micro HD cameras to provide panoramic UHD video content with a total resolution of about 10,000 x 2,000 pel. The flexible system is suitable for many different 360-degree panoramic productions. With its special mechanical and optical features the mirror-based OmniCam-360 enables optimal arrangement of multiple HD cameras for parallax-free stitching of 2D and 3D video panoramas in real time. A mirrorless version with 24 micro HD cameras allows the generation of 3D panoramas using approaches based on the light field theory.

Further key features of the lightweight systems are the robustness and compactness that allow for easy handling with minimum effort for adjustment and calibration. The high performance, functionality and practicability have already been successfully proven in several commercial productions.

Selected Reference Productions

Pioneering 360 degree UHD live productions

- FIFA World Cup™ final 2014, Rio de Janeiro
- Bon Jovi Australian Tour 2013, Brisbane
- Berlin Philharmonic's Concert (25th anniversary of the Fall of the Berlin Wall)
- Music documentary film PLAYING THE SPACE
- FIFA World Cup™ qualification, Cologne
- First Panorama-Live-Streaming through the Digital Concert Hall, Berlin Philharmonic
- Herbert Grönemeyer concert, Waldbühne Berlin
- BBC Proms concert, London
- Full ID Management, exhibition trailer, Bundesdruckerei
- Noise control demonstration, Deutsche Bahn AG

Real Time Stitching Engine and Preview Monitoring

Live panorama streaming and navigation

The Real Time Stitching Engine (RTSE) is a software-based solution that has been developed for real-time processing of panoramic UHD video. It supports all the processes needed for the production of UHD panoramas from a given number of omni-directional camera images, such as color matching, warping, stitching and blending.

The real-time software runs on a single multi-core PC equipped with off-the-shelf graphic boards and is able to process a number of HD input streams in parallel. Furthermore, the Real Time Stitching Engine supports different output formats:

- A down-sampled low-res panorama embedded in a regular HD frame that can be used for preview monitoring at the set, for viewing of dailies and editing of proxies in post-production;
- An HD frame that can be panned and zoomed within the high-res panorama to watch details of the panoramic content during live productions, to transmit partial HD frames out of the panoramic content in conventional broadcast environments or to allow user navigation in interactive applications;
- Multiple HD outputs by decomposing the full panorama into several overlapping HD tiles that can be encoded in parallel for live transmissions of entire high-res UHD content;
- The latest development makes it possible to transmit the UHD panoramic content to so-called Virtual Reality (VR) glasses so that the spectator is able to enjoy a truly immersive experience.

tiME Lab

Tomorrow's immersive Media Experience Lab

The TiME Lab is located at the Fraunhofer HHI in Berlin, Germany. Its mission is to explore R&D potential in the area of immersive media technology. With high definition video formats that break through today's 4K video resolution barrier and true three-dimensional sound that outperforms conventional channel-based audio systems, the performance as well as the viewing experience of the TiME Lab go beyond the limits of current digital cinema standards. The TiME Lab is an open platform inviting first-rate partners from the fields of art, culture, media, design and other creative industries to develop and test innovative content and new use cases.

Since 2012, Fraunhofer HHI also provides a mobile version of its TiME Lab. It can be used in a flexible manner for a variety of different applications including live transmission of panoramic UHD videos as well as panoramic showcases for exhibitions and trade shows. The Mobile TiME Lab is designed to operate as a room-in-room system and can accommodate audiences of up to 60 people. It has already been used on several occasions in the past.

www.timelab-hhi.com

Panoramic UHD video production and live streaming

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