Fraunhofer Institut Nachrichtentechnik Heinrich-Hertz-Institut

Live Panorama Video

Real-Time Acquisition and Projection of Immersive, High-Resolution Video Panoramas

Heinrich-Hertz-Institut science in action

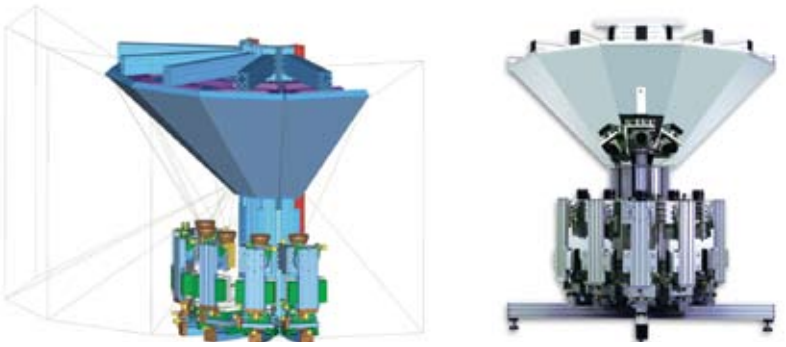
Features

- Real-time acquisition and projection of high-resolution video panoramas with large field-of-view (FOV)
- Capturing with flexible rig for up to five HD cameras with FOV of 150 degrees (available in the third quarter of 2007)
- Full circle rig for up to 12 HD cameras with 360 degree capturing capability planned for fourth quarter of 2007
- Exhibition with flexible, high-resolution multi-projection system
- Based on CineCard PCI-card that supports up to four projectors per board (and up to 16 projectors per PC)
- Unlimited cascading in both vertical and horizontal direction
- Immersive viewing experience that feels like `being there´

Fraunhofer Heinrich-Hertz-Institut is currently working on a complete end-to-end system for the real-time acquisition and projection of immersive, high-resolution video panoramas. The approach is based on a flexible, mirror-based multi-camera rig that uses multiple HD cameras to capture very high-resolution video panoramas. These videos are then exhibited with a flexible multi-projection system, which has also been developed at our lab, in order to provide the viewers with the immersive feeling of watching the event on-site from the very best seat.

Multi-Camera Rig

Fraunhofer Heinrich-Hertz-Institut is currently developing a multi-camera rig that can be used for the real-time capture of immersive, high-resolution video panoramas. The rig is designed for use with HD cameras; each individual view provides an opening angle of 30 degrees horizontally and 53.3 degrees vertically (portrait format). A first version of the rig supporting a maximum of five cameras will be available in the third quarter of 2007. With this setup it will be possible to capture seamless panoramas with a field-of-view of up to 150 degrees and a resolution of approximately 5400x1920 pel. A full circle rig for up to 12 HD cameras with 360 degree capturing capability is also planned for the fourth quarter of 2007.



Design drawing and prototype setup of multi-camera rig

Multi-Projection with On-Board Warping

For the exhibition of the panorama videos, the high-resolution imagery is split into overlapping sub-parts that are projected with a flexible, high-resolution multi-projection system. The heart of this system, which has been developed at Fraunhofer Heinrich-Hertz-Institut, is the so-called CineCard, a PCI plug-in card that contains dedicated hardware (e.g., for alpha blending, black level adjustment, and colorimetric corrections) for providing seamless transitions between the individual sub-images. The newest generation of the CineCard will also provide an on-board warping unit that will allow for the real-time adaptation of the subimage geometries to different screen layouts, projector setups, and viewing conditions.

Immersive 5k multi-projection of a football match shown at CinemaxX in Berlin

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