

Multiview Generation for 3D Digital Signage

3D Content for Displays without
Glasses based on Standard Stereo
Content

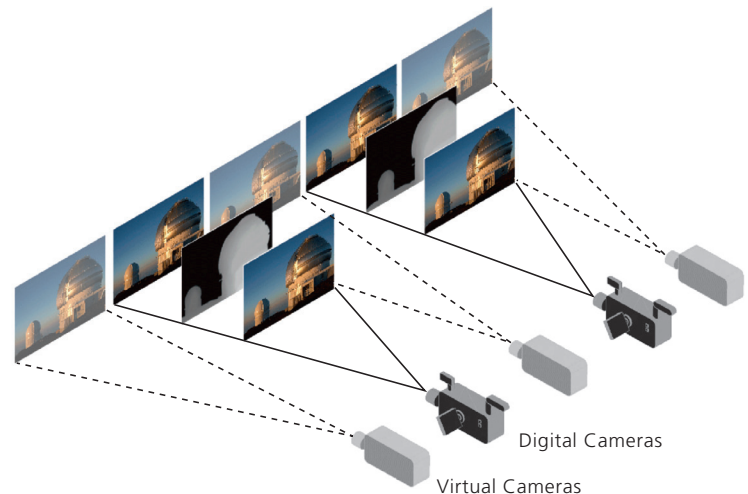
3D brings new perspectives to digital signage and other public displays that don't use 3D glasses. Format conversion from stereo to glasses-free 3D display specific multiview formats is a necessary postproduction step to bring existing S3D content into public areas where 3D glasses can't be used. 3D conversion creates the required number of extra views needed to generate autostereoscopic content. The Fraunhofer Heinrich Hertz Institute HHI provides dedicated conversion technology for almost any type of existing autostereoscopic display.

Challenges

Viewing 3D content at home or on mobile devices poses new challenges for 3D production. Unlike conventional stereo or 3D cinema, basic parameters such as viewing distance, screen size and illumination may vary considerably. What's more, future 3D multimedia displays will no longer necessarily require glasses. By converting standard stereo content to more suitable formats it can be adapted to specific autostereoscopic 3D displays, viewing conditions and user preferences.

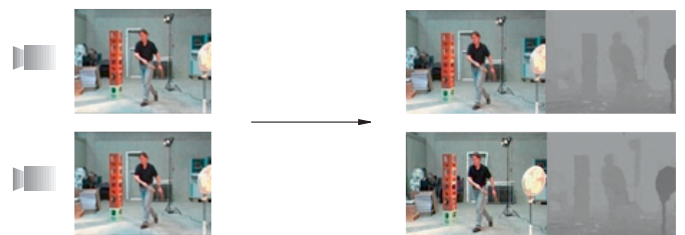
Technical Background

One solution is to use a generic depth-based production format where a pixel-by-pixel depth map is added to each stereo view by using dedicated disparity-estimation algorithms. These additional depth maps allow full control of depth scaling and interpolation of intermediate virtual views by means of Depth Image-based Rendering (DIBR). In the simplest case, the additional depth maps are generated

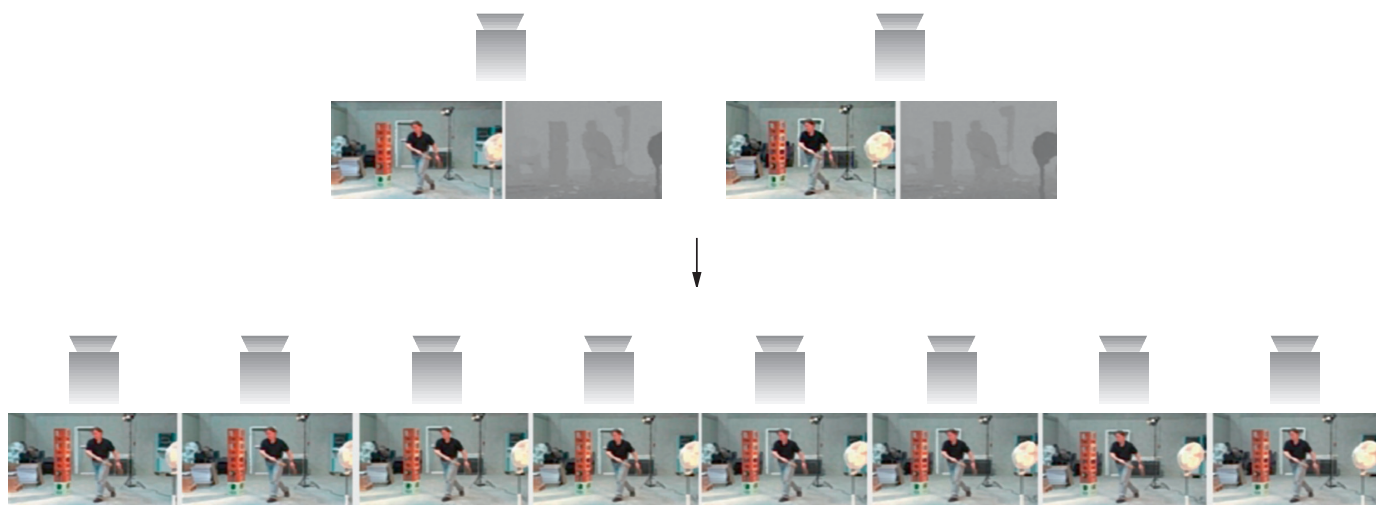


almost automatically after tuning parameters on a per-scene basis. In more complicated cases it is useful to assist the automatic process by feeding it with manually segmented key-frames beforehand or refining critical parts of the depth maps manually afterwards.

Starting from this generic depth-based production format, adaptation to any type of 3D display and related viewing conditions can be achieved. The specific display type defines the number of virtual views to be generated by DIBR. The inter-axial distance between the views defines the perceived depth range and can therefore be used to scale depth and adapt it to screen size, viewing distance and user preferences.



Conversion of stereo into generic depth-based format.



Rendering of display-specific views from generic depth-based format

Technical Features

- Automatic extraction of depth information from stereo content
- Conversion of stereo content to multiple video+depth (MVD2)
- Re-mastering of stereoscopic content by using MVD2 format
- Adaptation of stereoscopic content to different screen sizes)
- Generation of dedicated multiview sequences from MVD2
- Specific adaptation of depth range for selected 3D displays
- Tuning of multiview parameters for given content and display type
- Option of manual refinement to achieve improved 3D quality

Solutions and Services

In this context Fraunhofer HHI offers a suite of plug-ins for Adobe AfterEffects including sophisticated disparity estimation and rendering solutions. In addition the conversion is continued to be available as a service for most commercial auto-stereoscopic 3D displays. The final results can be delivered individually in full resolution but also interweaved, ready to use for a selected 3D display.

CONTACT

Ralf Tanger
Image Processing
Fraunhofer Heinrich Hertz Institute
Einsteinufer 37 | 10587 Berlin | Germany

phone +49 30 31002-2524
email ralf.tanger@hhi.fraunhofer.de
www.hhi.fraunhofer.de/ip