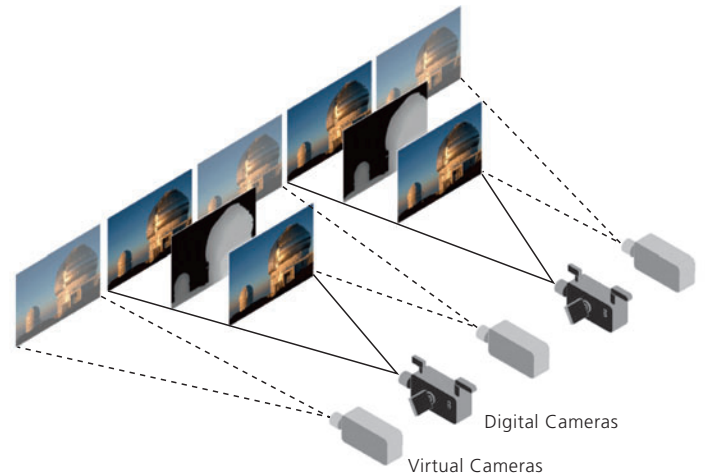


3D Multiview Generation

Conversion of stereo content
for auto-stereoscopic 3D displays



Format conversion from stereo to display specific multiview formats is an essential post-production process for future 3D services allowing the reproduction of stereo content on a wide range of 3D displays. Dedicated conversion can be provided for most of all existing auto-stereoscopic displays with up to 10 views.

Challenges

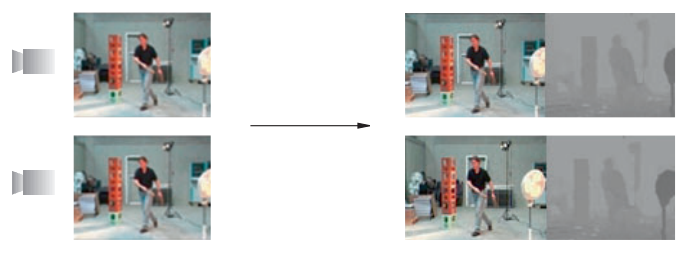
Viewing 3D content at home or mobile devices poses new challenges for 3D production. In contrast to conventional stereo or 3D cinema, basic parameters like viewing distance, screen size and illumination may change considerably. In addition, future 3D multi-media displays will not necessarily require glasses any longer. Recently, there was a lot of progress in the domain of auto-stereoscopic 3D displays. Thus, to watch standard stereo content under these circumstances and to adapt it to specific auto-stereoscopic 3D displays, viewing conditions and user preferences, it has to be converted to more suitable formats.

Technical Background

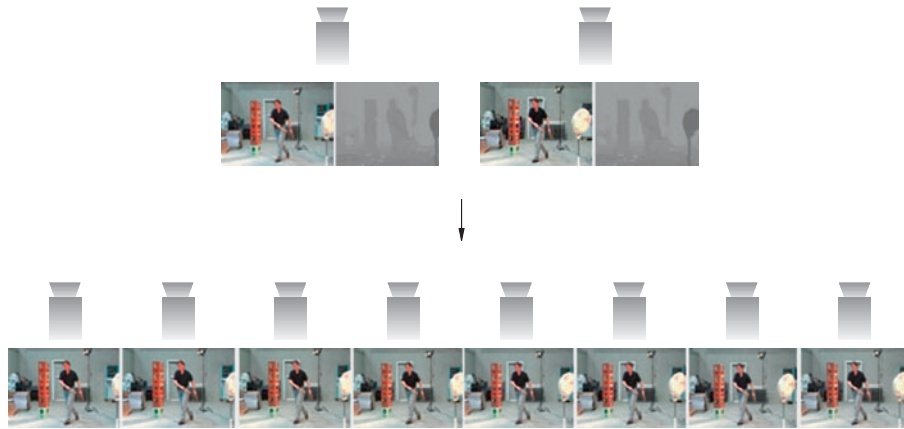
One promising solution is to use a generic depth-based production format where a pixel-by-pixel depth map is added to each stereo view by using dedicated disparity-estimation algorithms. These additional depth maps allow full control of depth scaling and interpolation of intermediate virtual views by 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 might be useful to assist the automatic process by feeding it with manually segmented key-frames beforehand or to refine critical parts of the depth maps manually afterwards.

Starting from this generic depth-based production format, an 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 to 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 depth enhanced stereo (DES)
- Re-mastering of stereoscopic content by using DES format
- Adaptation of stereoscopic content to different screen sizes
- Generation of dedicated multi-view sequences from DES
- Specific adaptation of depth range for selected 3D displays

- Tuning of multi-view parameters for given content and display type
- Option of manual refinement to achieve improved 3D quality

Services

In this context Fraunhofer Heinrich Hertz Institute offers the service to convert regular stereo material to any specific multi-view format and commercial 3D display. This includes the conversion from stereo to the needed number of views and adaptation of the related multi-view parameters to the given content and display properties. The final results can be delivered individually in full resolution but also, if possible and desired, interweaved, ready to use for selected 3D displays.

CONTACT

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