



CC3DR 2012 PROGRAM AND ABSTRACT



Collaborative Conference on 3D Research

June 25 – June 29, 2012

Seoul Palace Hotel
Seoul, South Korea



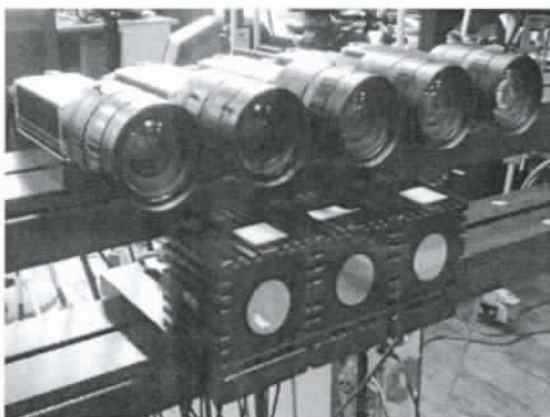
26-June 2012, 8:30-9:00 am

3D Video Content Generation using Multiple Color and Time-of-Flight Depth Cameras

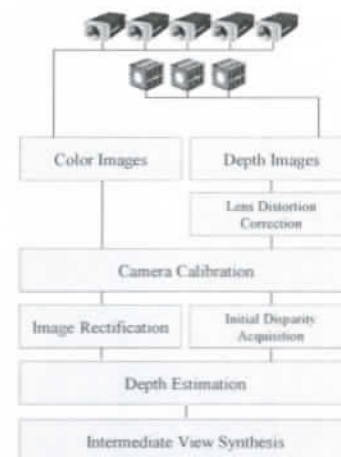
Yo-Sung Ho*School of Information and Communications, Gwangju Institute of Science and Technology (GIST), Gwangju, Korea**Email: hoyo@gist.ac.kr web site: <http://vclab.gist.ac.kr> <http://rbrc.gist.ac.kr>*

Recently, the demand for three-dimensional (3D) video contents has been increased rapidly. Watching 3D video contents through the 3D display gives more immersive and realistic sense to users. The 3D video contents are basically generated by the stereoscopic camera that provides two different viewpoints. In order to generate more realistic experience, we use multi-view image and multi-view video. The multi-view image can be captured by multiple cameras and it can cover a wider angle of the captured scene. Moreover, we can generate intermediate-view images between two cameras and then obtain free-viewpoint video contents using the depth information of the scene. The depth of the scene is represented as a depth map that indicates the range information of the scene. Acquisition of the correct depth map is important since the quality of synthesized images is highly dependent on the quality of the depth map.

In this talk, we introduce a 3D video content generation method using multiple color and time-of-flight (TOF) depth cameras [1]. The TOF depth camera measures the range between the camera and each object and provides the measured information as the depth image. Our camera system is composed of multiple cameras with three TOF depth cameras, as shown in Fig. 1(a). After capturing the scene, we apply several preprocessing operations to improve the image quality and increase the correlation among captured images [2]. Then, the depth image measured by the TOF depth camera is warped to the color image position, and used as an initial data for depth estimation [3]. By using the estimated depth map, we can generate intermediate view images. The procedure of the proposed method is explained in Fig. 1(b).



(a) Camera system



(b) Procedure

Fig. 1. Proposed camera system and procedure

Acknowledgement

This work was supported by the National Research Foundation of Korea (NRF) grant funded by the Korea Government (MEST) (No. 2011-0030822).

References

1. E.K. Lee and Y.S. Ho, "Generation of High-quality Depth Maps using Hybrid Camera System for 3-D Video," *Journal of Visual Communication and Image Representation*, vol. 22, issue 1, pp. 73-84 (2011).
2. Y.S. Kang and Y. S. Ho, "An Efficient Image Rectification Method for Parallel Multi-Camera Arrangement," *IEEE Transactions on Consumer Electronics*, vol. 57, no. 3, pp. 1041-1048 (2011).
3. Y. S. Ho and Y.S. Kang, "Multi-view Depth Generation using Multi-Depth Camera System," *Proc. of International Conference on 3D Systems and Application*, pp. 1-4 (2010).