From the Topical Issue Editor

Received: 10 March 2012 / Accepted: 15 March 2012
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Welcome to the topical issue
of 3D RESEARCH on
3DTV.

Capturing three-dimensional visual information of a real-life scene and creating an exact (except the scale) optical duplicate of it at a remote site instantaneously, or at a later time, are ultimate goals in visual communications over decades. All core and peripheral components related to this goal are collectively referred as “Three-Dimensional Television (3DTV)”. Although the history of 3DTV is almost as old as the TV itself, limitations in reconstruction accuracy, visual quality and user acceptance have prevented the development of relevant mass markets so far. Recent achievements in 3D techniques and application-driven demand triggered an increasing interest in 3DTV visual technologies. Currently, 3D motion pictures are shown in theaters, 3D blu-ray discs are produced and the first 3DTV programs have already started broadcasting.

In this context, tremendous efforts have been invested worldwide to develop efficient 3DTV systems, algorithms and applications. This includes improvements over the whole 3DTV chain, including capturing and representing of 3D scenery, processing and coding the captured data for transmission, and displaying the result for 3D viewing. All these functional components must be carefully developed and the overall design has to take into account the strong interrelations between the various subsystems, in order to achieve high quality 3DTV.

The contributions of this issue cover various aspects of 3DTV. First, L.C. Tran et al. present a novel stereo view synthesis algorithm that is highly accurate with respect to inter-view consistency, featuring the alignment and extraction of background layers for occluded regions. Then, I. Daribo et al. propose a 4D spatio-temporal rate-distortion (RD) optimized point cloud encoder via a curve-based representation of the point cloud, particularly well-suited for one-shot scanning systems. Next, M.H.P.H. van Beurden reviews the effectiveness of stereoscopic displays in medicine, while in the following paper, S. Zinger deals with the recent development in freeview point interpolation

for 3DTV. Y. Liu reviews the state-of-the-art technologies of mobile 3D video coding and streaming. Specifically, the mobile 3D video formats and the corresponding coding methods are reviewed and the streaming adaptation technologies including 3D video transcoding, 3D video rate control and cross-layer optimized 3D video streaming are surveyed. Finally, N. Vidakis et al. present a 3DTV application that enables displaying and exploration of thematic information in a 3D environment using the book and carousel metaphor.

I hope you will enjoy reading this topical issue on 3DTV, which presents the works and efforts of researchers with rather diverse experience and activity in distinct, yet related and complementary areas, in 3DTV.

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