

Proposal for A Tutorial Lecture at PCM2007

Multi-view Video Coding for 3D Multimedia Services

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Abstract

In recent years, various multimedia services have become available and the demand for realistic multimedia systems is growing rapidly. A number of three-dimensional (3D) video technologies, such as holography, two-view stereoscopic system with special glasses, 3D wide screen cinema, and multi-view video have been studied. Among them, multi-view video coding (MVC) is the key technology for various applications including free-viewpoint video (FVV), free-viewpoint television (FVT), 3DTV, immersive teleconference, and surveillance systems. The traditional video is a two-dimensional (2D) medium and only provides a passive way for viewers to observe the scene. However, MVC can offer arbitrary viewpoints of dynamic scenes and thus allow more realistic video. The multi-view video includes multi-viewpoint video sequences captured by multiple cameras at the same time, but at different positions. However, because of the increased number of cameras, the multi-view video contains a large amount of data. Since this system has serious limitations on information distribution applications, such as broadcasting, network streaming services, and other commercial applications, we need to compress the multi-view sequence efficiently without sacrificing visual quality significantly. In this tutorial lecture, we are going to cover both the basics and the current state-of-the-art technologies for multi-view video coding.

Duration: Three hours (half day) in the tutorial lecture

Equipments: Beam Projector, Laser Pointer, Notebook

Prof. Yo-Sung Ho: Biographical Sketch

Dr. Yo-Sung Ho received the B.S. and M.S. degrees in electronic engineering from Seoul National University, Seoul, Korea, in 1981 and 1983, respectively, and the Ph.D. degree in electrical and computer engineering from the University of California, Santa Barbara, in 1990. He joined ETRI (Electronics and Telecommunications Research Institute), Daejeon, Korea, in 1983. From 1990 to 1993, he was with Philips Laboratories, Briarcliff Manor, New York, where he was involved in development of the Advanced Digital High-Definition Television (AD-HDTV) system. In 1993, he rejoined the technical staff of ETRI and was involved in development of the Korean DBS Digital Television and High-Definition Television systems. Since 1995, he has been with Gwangju Institute of Science and Technology (GIST), where he is currently Professor of Information and Communications Department. Since August 2003, he has been Director of Realistic Broadcasting Research Center at GIST in Korea. From September 2005, he has been a visiting scholar at University of Washington, Seattle, USA. He gave several tutorial lectures at various international conferences, including the IEEE Region Ten Conference (TenCon) in 1999 and 2000, and the Pacific-Rim Conference on Multimedia (PCM) in 2006. He is presently serving as an Associate Editor of IEEE Transactions on Multimedia. His research interests include Digital Image and Video Coding, Three-dimensional Image Modeling and Representation, and Advanced Source Coding Techniques.

Prof. Yo-Sung Ho: Relevant Publications (2006)

1. "3D Video Player System with Haptic Interaction based on Depth Image-Based Representation," IEEE Trans. on Consumer Electronics, 52, 2, pp. 477-484, May 2006.
2. "Three-dimensional Natural Video System based on Layered Representation of Depth Maps," IEEE Trans. on Consumer Electronics, 52, 3, pp. 1035-1042, Aug. 2006.
3. "Inter-camera Coding of Multi-view Video Using Layered Depth Image Representation," Lecture Notes in Computer Science, Vol. 4261, pp. 432-441, Nov. 2006.
4. "H.264-based Depth Map Sequence Coding Using Motion Information of Corresponding Texture Video," Lecture Notes in Computer Science, Vol. 4319, pp. 898-907, Dec. 2006.
5. "Reconstruction of Multi-view Images from Layered Depth Images," ISO/IEC JTC1/SC29/WG11 MPEG2006, m12849, Jan. 2006.
6. "Core Experiment on View-temporal Prediction Structures (CE1 D: TU Berlin)," ISO/IEC JTC1/SC29/WG11 MPEG2005, m13198, April 2006.
7. "Prediction Structures for the Constructed Layered Depth Image Frames," ISO/IEC JTC1/SC29/WG11 MPEG2006, m13165, April 2006.
8. "Core Experiment on View-temporal Prediction Structures (CE1 D: KDDI)," ISO/IEC JTC1/SC29/WG11 MPEG2006, m13196, April 2006.
9. "Multi-view Video Coding based on Lattice-like Pyramid GOP Structure," Picture Coding Symposium (PCS), P2-18, pp. 1-6, April 2006.
10. "Coding of Layered Depth Images Representing Multiple Viewpoint Video," Picture Coding Symposium (PCS), SS3-2, pp. 1-6, April 2006.
11. "Core Experiment on View Interpolation Prediction (CE3)," ISO/IEC JTC1/SC29/WG11 MPEG2006, m13580, July 2006.
12. "Global Disparity Compensation for Multi-view Video Coding," ISO/IEC JTC1/SC29/WG11 MPEG2006, m13581, July 2006.
13. "Complete Coding Result of Layered Depth Image Frames," ISO/IEC JTC1/SC29/WG11 MPEG2006, m13582, July 2006.
14. "Global Disparity Compensation for Multi-view Video Coding," ISO/IEC JTC1/SC29/WG11 MPEG2006, JVT-U100, Oct. 2006.
15. "Reconstruction of Reference Frames for Multi-view Video Coding," ISO/IEC JTC1/SC29/WG11 MPEG2006, JVT-U101, Oct. 2006.
16. "View Interpolation for Multi-view Video Coding," ISO/IEC JTC1/SC29/WG11 MPEG2006, JVT-U102, Oct. 2006.