

Research and Activities on Ultra-realistic Communications

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Abstract: Ultra-realistic communications are future means of communicating that provide users with a highly realistic presence. The technologies to achieve these communications are varied and include ultra-high definition/3-dimensional images, reproduction of highly realistic surround sound, and multisensory communication that includes touch and smell.

Japan Broadcasting Corporation (NHK) is developing Ultra-HDTV system, called Super Hi-vision, which has four times the pixels of HDTV both horizontally and vertically. The images can be viewed as close as 0.75 times the height of the screen. At the proximity, the angle of viewing is 100 degrees, which confers an enhanced sense of reality.

National Institute of Information and Communications Technology (NICT) is researching Ultra-realistic communication technologies that provide natural and real information to everybody. Main research subjects are holographic 3D video, super multi-view 3D video without special glasses on and super surround audio systems. We also researching necessary requirements for ultra-realistic systems based on underlying principles of human information processing.

The Ultra-Realistic Communications Forum was established on 2007 to ensure efficient industry-academia-government collaboration in research, development, verification experiments, and standardization on ultra-realistic technologies.

Ultra-realistic communication systems have quite huge amount of data. For example, the data rate of Super Hi-vision is 72Gbps, super multi-view 3D video is more than 200Gbps and electronic holography video is more than several hundred Tbps. Then efficient video coding algorithms are required for the ultra-realistic communications.

In the Symposium, I will describe research and activities of ultra-realistic communications and the expectation of new picture coding technology.

Keywords: Ultra-reality, Ultra HDTV, Three dimensional video, Three dimensional sound field reproduction, Multi-sensory communication, Electronic

holography, Human information processing