# 3D Television

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Three-dimensional TV is expected to be the next revolution in the history of television. It has only recently become feasible to deal with the high processing and bandwidth requirements for real-time acquisition, transmission, and display of high-resolution 3D TV content.

3D TV involves the inclusion of one or more extra video signals besides a regular monocular video signal, such as a depth signal and/or additional views of the same scene. A 3D video is typically obtained from a set of synchronized cameras, which are capturing the same scene from different viewpoints (multi-view video). This technique enables applications such as free-viewpoint video and 3D-TV. A free-viewpoint video player provides the ability for users to interactively navigate and select a viewpoint in the video scene. A free-viewpoint video player is therefore similar to a 3D computer graphics rendering engine. A 3D or multi-view display like stereoscopic display allows the viewer to perceive the depth of the scene using multiple views.

A class of 3D video systems is based on multiple views of the video scene, called *N*-view. One advantage of the *N*-view representation format is that no 3D geometric description of the scene is required. Therefore, because 3D geometry is not used, this 3D video format allows a simple video processing chain at the encoder. However, such a 3D video representation format involves a high complexity decoder. A multi-view display supports a varying number of views at the input, which makes it impractical to prepare these views prior to transmission. Instead, intermediate views should be interpolated from the transmitted reference views at the decoder where the display characteristics are known. To obtain high-quality interpolated views, a 3D geometric description of the scene is necessary, thereby involving computationally expensive calculations at the receiver side.

In this tutorial we shall cover different aspects of 3DTV – (i) Content Acquisition; (ii) Content Processing and Coding; (iii) Transmission and (iv) 3D Display.

**About the speaker**:

Santanu Chaudhury received the B.Tech. and Ph.D. degrees from the Indian Institute of Technology (I.I.T.), Kharagpur, in 1989 and 1984, respectively. He is currently the Schlumberger Chair Professor in the Department of Electrical Engineering, I.I.T., Delhi. His research interests are in the areas of multimedia information retrieval, document image analysis and artificial intelligence. Dr. Chaudhury was awarded the INSA medal for young scientists in 1993. He is a fellow of Indian National Academy of Engineers and National Academy of Sciences, India.