

Course Description

With the evolution of color digital television and digital broadcasting systems we have seen the rapid evolution of TV and video over the past 10 years. Direct satellite and digital cable systems now offer both standard definition and High definition TV. Analogue terrestrial TV broadcasting is being replaced entirely with digital and HDTV over terrestrial systems.

The natural next step after HDTV will be the introduction of 3D services but the standards and technologies for this is more complex and, until recently, less well developed. With the completion of DVB standards for Multiview coding (MVC) enhancements this is now set to change and allow 3D services to expand.

This Hands-On course will provide a technical overview of the challenges of delivering 3D video services. It will address the visual perception issues as well as the mechanisms of encoding and transporting 3D TV services.

The course will then look at the competing systems that already exist as well as the parts of the standardization that have been completed and available, as well as vendor independent standardization.

Hands-On exercises will allow students to build 3D Video presentations and experiment with different ways of viewing 3D TV applications and services.

Students Will Learn

- **Identify the visual perception concepts needed to deliver 3D visual systems**
- **Appreciate how 3D video can be encoded**
- **Examine how MPEG transport streams can be adapted for 3D video transport**
- **Compare HDTV and Multiview 3D HDTV encoding**
- **Discuss evolving products that exist for 3D implementation**
- **And More...**

Target Audience

Anyone interested in learning and working with 3D Digital TV.

Prerequisites

Basic understanding of broadcast TV and digital fundamentals.

Course Outline

Module I: Stereoscopic Vision and Human 3D Perception for Video

Visual perception

Stereoscopic 3D viewing

Motion perception

Video and TV

Colour perception and encoding

Analogue and digital broadcast TV

Digital Video Broadcasting

2D Camera Systems

Hands-on exercise viewing 3D images

Module II: Sources of Standards

Motion Picture Experts Group

Digital Video Broadcast

ETSI

ITU

ATSC

Open IPTV Forum

Cablelabs and DOCSYS

MPEG Industry Forum

Module III: Digital Encoding of TV for 3D

Evolution of MPEG Encoding

MPEG-1 and MPEG2

MPEG-4

H.264

MPEG-4 part 10

Video Profiles

SD Profiles

HD Profiles

Profiles for 3D

Options of encoding 3D

Conversion from 2D to 3D

Hands-on Exercise shooting Stereoscopic Video

Module IV: MPEG Program and Transport of 3D Video

Program streams

Transport streams

Service Information

Program Service Information

Carrying services over IP

Module V: Multiview Video Encoding

H.264 Annex H

Syntax and Semantics

MVC Decoding Process

Reference Pictures

Anchor Pictures

Base View Bit Stream

Multiview High Profile

Levels

Supplemental Enhancement Information Messages

Video Usability Information Parameter Extension

Hands-on Exercise Building a 3D Video Clip

Module VI: 3D Video Display Systems

Anaglyphic 3D using passive red-cyan glasses

Polarization 3D using passive polarized glasses

Alternate-frame sequencing using active shutter glasses/headgear

Autostereoscopic displays without special viewing glasses

Example 3D TV systems

Blu-ray 3D recordings

3D Broadcasting Channels

Module VII: Glossary, Reference and Review

Delivery Method

Instructor-Led with numerous Hands-On labs and exercises.

Equipment Requirements

(This apply's to our hands-on courses only)

BTS always provides equipment to have a very successful Hands-On course. BTS also encourages all attendees to bring their own equipment to the course. This will provide attendees the opportunity to incorporate their own gear into the labs and gain valuable training using their specific equipment.

Course Length

2 Days