Technical Presentations

Modulator/demodulator Prototype for Digital Broadcasting and Mobile Communications Using Software Defined Radio Technology

Naohiko IAI, Digital Broadcasting Networks

Research is underway on software-defined radio technology, which describes reception functions for broadcasting receivers and cellular phones in software. The presentation described a multi-mode modulator/demodulator prototype for digital terrestrial broadcasting and multiple communication media. It also described the procedure to switch the broadcasting and communication protocols and update reception functions by loading software.

Transmission Technologies for Millimeter-Wave Mobile Cameras

Hiroyuki FURUTA, Digital Satellite Broadcasting Systems

The use of a wireless Hi-Vision (HDTV) camera system is expected to have a significant effect on TV program production. The presentation described a millimeter-wave mobile camera and assessed the potential of a millimeter-wave radio transmission system based on the MIMO-OFDM scheme. It also included the results of a study on the propagation characteristics of 55-GHz-band millimeter-waves in TV studios, and described a new method of propagation channel estimation and maximum likelihood demodulation.

Efficient Program Production Using Robot Cameras

Takao TSUDA, Multimedia Services

To provide program production support and create new types of video expression, this research is intended to create a robot camera that is capable of shooting images as if it were being operated by a professional cameraman. Recent developments include the construction of an intelligent robot camera equipped with intelligent software and a mobile robot camera that can perform shooting while freely moving around a studio.

Modeling of Dynamic 3D Objects and Its Application

Kimihiro TOMIYAMA, Advanced Audio and Video Coding

One way to generate highly realistic three-dimensional moving objects is to produce high-definition 3D models based on images of a subject from multiple viewing points taken with multiple cameras. This presentation explained a new method to re-construct the 3D shape of an object using images from multiple viewing points and a texture mapping method, and reported on dynamic 3D object generation experiments.

Mixed Reality Audio-Visual Reproduction System

Hiroyuki OKUBO, Three Dimensional Audio Visual Systems

We constructed a Mixed Reality Audio-Visual Reproduction System (MRAV) to study the way three-dimensional computer graphics appear (including actual-shot 3D images), which is an important factor for highly realistic audio-visual presentation, as well as to study audio-video interactions. This system can realize interactive sound field reproduction linked with stereoscopic CGs.

High-quality Speech Synthesis Method

Hiroyuki SEGI, Human Science

We have been conducting research on a high-quality speech synthesis method to improve computer-generated voices, giving them a more natural sound. This new high-quality speech synthesis system realizes naturally sounding speech through the use of a massive speech database, which consists of recordings of an announcer reading from past news programs. The system selects the combination with the smoothest sound flow of words and phrases to compose an entire sentence based on the database.

Field Emitter Array Image Sensor with HARP Target

Yoshiro TAKIGUCHI, Advanced Imaging Devices

A field emitter array image sensor with a HARP target will be a key component of an ultrahigh-sensitivity compact HDTV camera. We fabricated a prototype 256×192 pixel sensor with a pixel size that is approximately 1/3 (50μm×50μm) that of a conventional device, equipped with an electron-beam focusing system consisting of permanent magnets. The prototype sensor significantly enhanced picture quality characteristics such as the resolution and has the prospect for increased definition.

Highly Luminous and Efficient Phosphor Materials for Field Emission Displays

Katsu TANAKA, Display and Optical Devices

We studied highly luminous and efficient phosphor materials with a new excitation process for field emission displays. As an example of using the new process, we demonstrated the excellent luminescent properties of a blue emitting $SrGa_2S_4$ thin film. A high internal luminous efficiency* of 18.8 lm/W was obtained at an accelerating voltage of 5 kV and a current density of 60μA/cm^2.

* Luminous efficiency inside of the phosphor material, which is independent on the phosphor's form (powder, thin film, etc.).

Autonomous Storage System for Broadcasting Stations

Ryo TAGUCHI, Recording Technology and Mechanical Engineering

Studies are progressing on an autonomous storage system with the aim of constructing a highly reliable and scalable content server capable of high-speed content input/output via a network. A prototype system that can store HDTV content was constructed, on which basic functions such as failure recovery, load balancing, and the addition/removal of a storage device online were verified.

Broadcasting System Based on Home Servers Utilizing Telecommunication Networks

Akitsugu BABA, Project on Broadcasting System using Broadband Network

Advances are being made on element technologies for broadcasting services based on home servers using communications networks. Recent research results involve a metadata technology that allows various viewing styles, including new services that seamlessly incorporate broadcasts, stored contents, and broadband contents, and an advanced CAS technology that enables rights protection and access control of any type of content with a single CAS card.