

# Digital Processing of Video Signals

Montreal, February 9, 1984 — Maison Radio-Canada

This one-day tutorial precedes the 1984 SMPTE Television Conference but is arranged independently by the Canadian Broadcasting Corp., Bell Northern Research, and INRS Telecommunications from the University of Quebec.

This tutorial covers many of the fundamental and applied aspects of digital processing of video signals. It is intended for engineers and technical managers who need to familiarize themselves with different aspects of the emerging digital video signal processing techniques and technologies.

## Tutorial Outline

### I. Introduction

### II. Sampling and Quantization

Multi-dimensional spectrum

Sampling and reconstruction of video signals

- Sampling frequencies and patterns

- 3-D spectrum of sampled video signals

- Multi-dimensional digital filtering for reconstruction

### Quantization

- Viewer's properties
- Uniform and nonuniform quantization
- Quantization noise spectrum shaping

### III. Digital Television Systems

- Digital composite signal format
- Digital component signal format
- Higher resolution systems
- Digital processing techniques for quality enhancement

### IV. Digital Transmission and Distribution of Video Signals

Digital networks

- Digital transmission hierarchy and bit rates

- Digital transmission facilities

Bit rate reduction techniques

- Interframe and intraframe predictive coding techniques

- Transform coding techniques

- Hybrid predictive/transform techniques

- Examples of bit rate reduction systems

- Impact of bit rate reduction

### V. Digital Video Processing Hardware Systems

General purpose computer simulation systems

Real-time programmable hardware systems

The tutorial will be given by several experts in the digital video field:

Dr. S. Sabri, *Bell Northern Research*  
Dr. E. Dubois, *INRS Telecommunications*

Dr. E. Tarnai, *Bell Northern Research*

Mr. K. Davies, *Canadian Broadcasting Corp.*

Registration forms will be available in November. For further information, please contact:

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## SMPTE Report

## BKSTS '83

BKSTS '83, the eighth Film and Television Technology Conference and Exhibition organized by the British Kinematograph, Sound and Television Society (BKSTS), opened on June 27 in the Royal Lancaster Hotel for a week of technical sessions, a technical visits program (studios, laboratories, TV stations, equipment manufacturers), and other exciting events.

### Technical Papers Program

The opening address was given by BKSTS President, Alan Hirst. The first session, entitled "How Far Have We Come," consisted of three papers on the significant advances that have recently been made in film, video, and sound technology. In the first paper,

"Opticals in Harmony with Motion Control," author Gary Pearlman, Camera Effects, noted that over the past decade special optical effects have allowed designers and directors greater and greater scope. Specially designed computer guidance systems, he said, offer precision control over a range of movements previously unattainable.

"Sound in the Eighties," presented by Tony Faulkner, described some of the challenges to professional sound recordists, resulting from digital audio.

Mike Luckwell, The Moving Picture Company, author of the third paper, "Creativity Meets Computer," said, "The unlikely combination of artist and computer is fusing to provide

us not only with new images but with new and challenging mediums." He cited the main areas of applications as: electronic and video effects; digital picture manipulation; character generators and paint boxes; 3-D computer imaging; and motion control.

The first session dealt with what has actually been accomplished. The closing session on July 1, fittingly dealt with "The Shape of Things to Come." The first paper in that session, "The Future of Film," by Roy Jeffreys, Kodak Ltd., provided an optimistic outlook on what can be expected of film in the future. "Feature Films — The End or the Beginning," by John Chambers, Goldcrest Films and