OPTICAL INFORMATION PROCESSING
Real Time Devices and Novel Techniques

A seminar on state-of-the-art developments in theory, application, and implementation of optical information processing. Two main topics are "Spatial Light Modulators" and "Novel Operations and Processing Techniques."

Chairman: David Casasent, Carnegie-Mellon University, Pittsburgh
Co-Chairman: Alexander A. Sawchuk, University of Southern Calif.

SESSION 1 ........................ Tuesday, August 24, 8:45 am

REAL-TIME, REUSABLE SPATIAL LIGHT MODULATORS 1
Use of DKDP Spatial Light Modulators in Optical Information Processing.
The ERIM TOPR in Optical Data Processing.
Real-Time Optical Processing and Applications
Photorefractive Materials for Optical Storage and Display.
Optical Recording and Processing Using Photodichroic Crystals.

SESSION 2 ........................ Tuesday, August 24, 1:30 pm

REAL-TIME, REUSABLE SPATIAL LIGHT MODULATORS 2
Hybrid Liquid Crystal Light Valve-Image Tube Devices for Optical Data Processing.
Information Storage and Display Techniques Using PLZT Ceramics.
The Tek PROM-A Status Report.
Optical Information Processing with the Ruticon.

SESSION 3 ........................ Wednesday August 25, 8:45 am

NOVEL OPERATIONS AND PROCESSING TECHNIQUES
Two Improved Coherent Optical Feedback Systems for Optical Information Processing.
Frequency-Variant Optical Signal Processing.
Combined Geometrical and Optical Transforms for Invariant Processing.
Matrix Multiplication Using Coherent Optical Techniques.
Optical Spatial Channel and Image Encoding Principle.

SESSION 4 ........................ Wednesday August 25, 1:30 pm

NOVEL OPERATIONS AND PROCESSING TECHNIQUES 2
Techniques and Applications of Nonlinear Processing with Halftones.
Bandlimiting Considerations in Geometrical Distortion Systems.
Optical Cross-Correlation by Complex Exponentiation of the Input Data.
A Tracking Receiver with Holographic Information Processing.

ADVANCES IN IMAGE TRANSMISSION TECHNIQUES

A conference addressing various problem areas associated with efficient transfer of visual information through communication channels. Image transmission will be discussed as applied to the following fields: Image modeling, coding, psychophysical considerations, channel effects, image quality, and display technology.

Chairman: Andrew G. Tescher, The Aerospace Corporation.

SESSION 1 ........................ Tuesday, August 24, 8:45 am

IMAGE TRANSMISSION SYSTEMS
A Real-Time Adaptive Hadamard Transform Video Compressor.
Digital Coding of Shuttle TV.
Channel Coded Compressed Television System Using Communications Technology Satellite (CTS).
Adaptive, Hybrid and Multi-Threshold CAQ Algorithm.
HAAR Transform Video Bandwidth Reduction System for RPV'S.
RPV Video Communications—New Challenge to Video Data Compression.
Experimental Image Compression Subsystem.

SESSION 2 ........................ Tuesday, August 24, 1:30 pm

VISION AND SPECIAL TOPICS
Visual Performance Applied to Encoding of Pictures.
Simulations of Electro-Optic Image Sensor Performance.
Applications of Computer Vision.
Detection & Coding of Edges Using Directional Masks.
Color Edge Detection.
Considerations on Data Compression of Synthetic Aperture Radar Images.
Role of Microprocessor in Real Time Preprocessing of Multispectral Scanner Data.
Analytical Research on Apparent Movement Perception—Psychophysical Considerations.

SESSION 3 ........................ Wednesday August 25, 8:45 am

THEORETICAL CONSIDERATIONS
Quantizer Designs Using Visual Thresholds.
Theoretical Performance Models for Interframe Transform & Hybrid Transform/DPCM Coders.
Critical Comparison of Fast Transforms.
Transform Image Compression on Permuted Images.
Color Image Processing within Framework of Human Visual Model.
Rate Distortion Coding Simulations for Color Images.
Inadequacies of Markov Model in Linear Predictive Coding of Images.

SESSION 4 ........................ Wednesday, August 25, 1:30 pm

APPLICATIONS
Interframe Coding of Monochrome Television—A Review.
Block Character Coding.
Effects of Finite Computational Accuracies on Several Discrete Cosine Transform Architectures.
ERTS Resources Data Classification & Transmission.
Channel Rate Equalization Techniques for Adaptive Transform Coders.
Adaptive Hybrid Picture Coding.
Video Link Data Compression for Remote Sensors.