

SOCIETY FOR INFORMATION DISPLAY



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COLOR IN ELECTRONIC DISPLAYS

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Summary

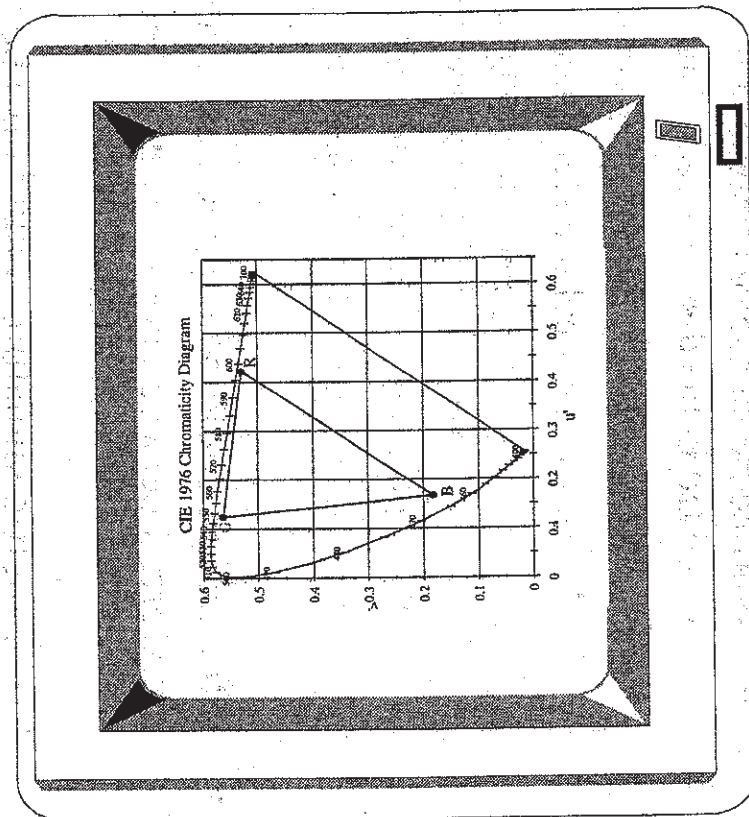
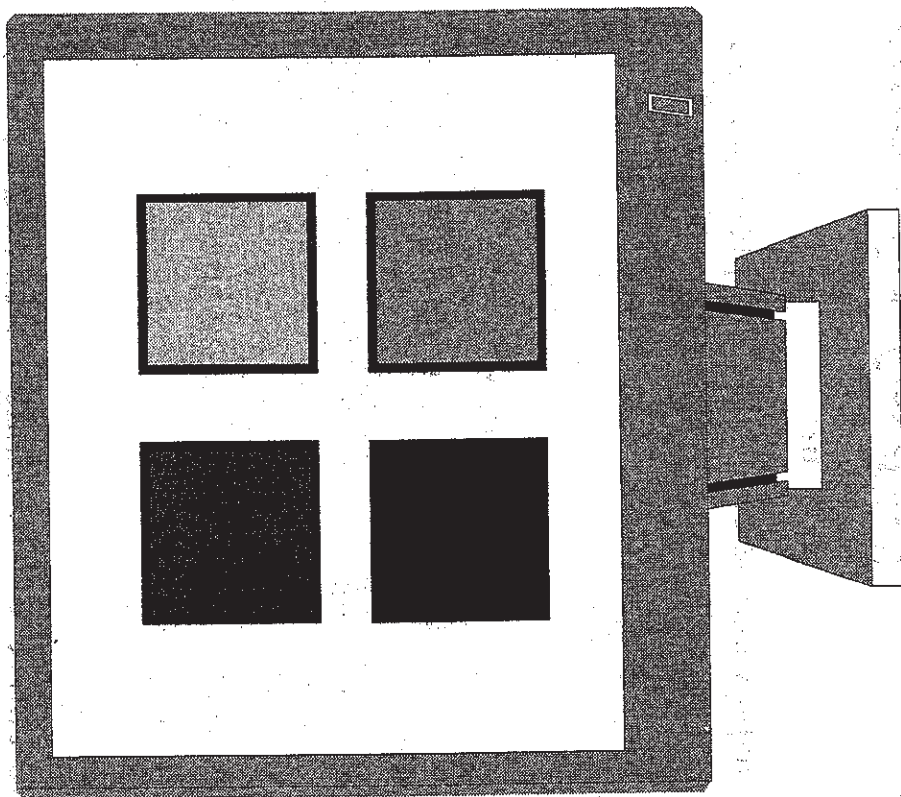
The technology for the control and display of color images has undergone great advances in recent years. A variety of both emissive and non-emissive information-display technologies are currently color-capable. However, of the display devices which are now readily available on the open market, CRTs and LCDs remain the two principal electronic display technologies capable of generating high-quality color images. This seminar focuses on the basic operating principles of color CRT and LC displays, their means of producing and controlling color, and quantitative methods for characterizing, modeling, and optimizing the color performance of both emissive and non-emissive types of displays.



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Adding Intelligence to Color Display Systems



Adding Intelligence to Color Display Systems

- Embedded “intelligent” display processors
 - colorimetric signature or personality of the display can be embodied in a processor and embedded in the display head or an associated controller
 - color primary chromaticity coordinates
 - primary channel transfer functions
 - momentary gain and offset settings
 - inverse correction or compensation functions
 - display white point or white reference level
 - primary channel maximum luminance scale factors
- Information could be supplied as header information on color image files being transferred between color imaging devices or systems
- Colorimetric signatures could also be used to convert color image files to a device-independent representation (e.g. tristimulus values) prior to image transfer
- Colorimetric signatures of both the originating and target devices would be used to reconstruct color images

Adding Intelligence to Color Display Systems

- Embedded auto-calibration functions
 - use integral calibration sensor
 - closed-loop calibration of white point, maximum luminance and transfer functions
- Embedded gamut clipping, compression and mapping algorithms
 - scaling of tone reproduction function
- Some of the above functionality is already becoming incorporated into high-end color CRT monitors (e.g. Barco Calibrator series of color monitors)
- Intelligent color LCD controllers (see Lee et al., 1992)
 - accommodate a variety of pixel mosaics
 - embody independent LCD transfer functions for each primary color channel
 - compensate for temperature variations in LCD transfer functions
 - embody spatial/temporal dithering and anti-aliasing functions