

There has been an explosive growth in the use of digital images in disciplines such as medicine, astronomy, computer design, industrial inspection, and biology, to name a few.

One of the drivers for this growth has been the emergence in the marketplace of scanning and recording techniques first developed for the military and for the space program. For example, solid-state detectors developed for the space program have spawned new species of scanners that have found wide commercial application in industries such as the graphic arts.

Also, the laser beam recorder (LBR) was developed as the only practical way to store images from high-data-rate imaging systems; now, the LBR is the scanner of choice for a wide variety of recorders, even though storage capacity is no longer the technological driver.

This special issue of *Optical Engineering* was formed to survey the state of the art of scanners and recorders and to present some typical applications.

The first paper presented in this special issue, written by Leo Beiser, addresses the topic of analysis of the resolution of laser scanning systems. The second paper, by Ralph Wight, is also concerned with performance prediction and addresses the performance of a charge-coupled scanning imaging device. An input scanner and output recorder system is described by Andrew Warner in the third paper. This flat-field, variable format system uses a HeNe laser for scanning and an Ar-ion laser for plotting. A laser output image recording device, for halftone or continuous tone hardcopy image generation, is described in a paper by Rose Korte and Tom Lianza. This is a drum recorder using a HeCd laser. Three application papers are also presented. To Russell Hsing reviews thresholding techniques, including adaptive thresholding, for applications of digital display and electronic printing. Thomas Chang et al. describe digital image processing for automated characterization of flow fields using thresholding and pattern matching algorithms. This processing system obtains digital data from film images, with the use of a flatbed digitizer. Arthur Toga et al. describe an image analysis application in neuroscience, and an interactive image processing system that includes an input flatbed digitizer and output camera system.

Those knowledgeable about digital input scanning and output recording technology realize that this issue has only touched on a segment of available devices and techniques. Digital imaging systems extend far beyond the scope of this one issue, but it is the hope of the guest editors that this issue provides some additional contribution to the wealth of information available.

Guest Editorial

Image Scanning and Recording Methods

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