



Image Enhancement Through Algorithmic Acquisition

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- Electrical Engineering
- NSWC Crane

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- Crane
- Electrical Engineering
- Image Processing
- Laser Scan

The U.S. Navy seeks a partner for licensing and collaboration on a system and method for image enhancement of scan generators.

Current methods of image enhancement utilize pixel sampling, averaging, and integration. These methods miss features that are unique to the material being analyzed.

NSWC Crane has developed and patented a voltage image enhancement system for use with scan generators. Scan generators for imaging are an integral part of scanning electron microscopes and laser scanning imagers. The non-linear response during the pixel cycle is the phenomena that enables image enhancement. Stimulation by a source such as electron beam or laser, random noise, secondary particle lifetimes, and photoluminescent processes are a few of the processes that can result in non-linear response during the pixel cycle. Algorithmic processing of the oversampling during the pixel interval can result in image enhancement that can intensify or eradicate the features caused by the non-linear response. •

The scan generator image enhancement works by first stimulating a device under test at electrical interconnects. The internal clock of the DUT is synchronized with the scan rate of the source to reduce the noise of the output signal and enhance a resultant image. A phase adjustment is effected to further reduce the noise in the signal. The synchronization and the phase adjustment ensure the data is collected at uniform times relative to the reference signal and reduces noise introduced into the system by such offsets. Post-scan processing increases the signal-to-noise ratio through averaging techniques, using a pixel overlay algorithm the averaged data is transformed into a 2-D array and the image of the DUT is reconstructed.

People:

- Duncan, Adam (Project leader)
- Barsun, H. Fred
- Martin, Douglas

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Contact OTC:

Purdue Office of Technology Commercialization

The Convergence Center

101 Foundry Drive, Suite 2500

West Lafayette, IN 47906

Phone: (765) 588-3475

Fax: (765) 463-3486

Email: otcip@prf.org