

There are a growing number of technologies suited to digital radiography and digital mammography. These include imaging systems based on photo-stimulated phosphors (PSP), thin-film transistor (TFT) detector arrays, CMOS detectors, electrostatic readout of photoconductors and photon-counting technology. The transition to digital imaging has also enabled a number of advanced image acquisition and processing techniques to become practical. Dual-energy imaging has already been shown to improve visualization of lung nodules and to have a role in contrast-enhanced mammography. Contrast-enhanced imaging is under investigation for a number of diseases. Stereoradiography has been investigated in imaging both the thorax and the breast. Tomosynthesis, the synthetic generation of tomographic images, is being investigated in imaging the thorax, breast and musculoskeletal system.

It is relevant, in this rapidly evolving field, to discuss the relative merits of the various technologies and to attempt to foretell the most likely advances. It is also relevant to examine the applicability of each technology to advanced techniques for image data acquisition, image processing, and image data visualization. Specifically, we will consider how the various technologies (PSP, TFT, etc.) are applicable to such techniques as dual energy, stereoscopy, tomosynthesis, contrast-enhanced imaging, and computer-aided diagnosis (CAD). Panelists will discuss how the choice of technology impacts upon these applications. Does, for example, the value of tomosynthesis result in a brighter future for TFT-based image systems? Or, does the need for rapid data readout in tomosynthesis negatively impact detector design? Does PSP-based dual-energy imaging have advantages over photon-counting detectors, where the ability to resolve x-ray photon energy might be feasible? These are but a few of the many questions that will be raised.

Learning Objectives:

- 1) Understand the state-of-the-art in the technologies for acquiring digital radiographic and digital mammographic images
- 2) Learn what advanced image acquisition and image processing methodologies are under development.
- 3) Participate in discussions regarding the interplay of the choice of the detector technology and the various advanced imaging methods.
- 4) Glimpse the future of digital radiography and digital mammography