



Invited Talk

Objective Assessment of Sonographic Quality and Application in Breast Cancer Diagnosis

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Biography: Sara Bahramian received the BSc degree in electrical engineering from the University of Tehran in 2005, and the MSc degree also in electrical engineering from Sharif University of Technology in 2007. Currently, she is a PhD candidate in electrical engineering at the University of Illinois at Urbana-Champaign, USA. She is also affiliated with Beckman Institute for Advanced Science and Technology and a member of the Ultrasonic Imaging Lab at the University of Illinois. During 2012, she served as a research intern in the US Food and Drug Administration (FDA) center for medical devices and radiological health. In 2013, she received a fellowship from Computational Science and Engineering Institute and is a CSE fellow since then.

Abstract: The quality of any image-based diagnosis is influenced by three essential components: the task information presented by the patient (i.e., the reason for imaging), the quality of acquisition- and display-stage instruments for recording and displaying that information, and the diagnostic skills of observers viewing the image data. We are studying interactions among these three components to discover image-quality metrics that predict overall best-possible performance by a sonographic system at breast lesion classification tasks. Assessments of image quality based on ideal performance serve to inform design improvements that directly impact clinical performance. Our approach provides tools to explain how processing might reduce diagnostic task information. We also discuss how simple methods can recover the loss for improved diagnostic performance. We study the improvement in detecting breast microcalcifications using the proposed method.

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