Automated Classification of Tissue in Digital Breast Tomosynthesis Images

Published date: May 30, 2014

Technology description

Market Summary

A recent study published in the New England Journal of Medicine estimated that more than one million women have been treated for cancers that likely would never have posed a threat to their lives. They estimated that up to one-third of breast cancer cases do not need treatment. These over-diagnoses in which cancer is present but does not need treatment may account for a large amount of unnecessary healthcare costs. Digital Breast Tomosynthesis (DBT), or 3D mammography, in combination with traditional digital mammography detects up to 40% more invasive cancers and decreases false positive rates by 15%. Although DBT is not reimbursable, the adoption rate of the technology has increased dramatically in recent years as several large clinical studies have validated its benefits. In addition, use of these images may help decrease the incidence of over-diagnosis and thus, likely lower the overall costs for patients and their therapies.

Technical Summary

DBT is a pseudo-three-dimensional x-ray imaging modality designed to decrease the effect of tissue superposition present in mammography and as a result increase clinical performance in the detection and diagnosis of breast cancer. Classification of breast tissue with DBT is challenging, however, because DBT images include complicated structures, image noise, and out-of-plane artifacts due to limited angular tomographic sampling. Emory researchers have developed an automatic method to classify fatty and glandular tissue in DBT images. The results of this method have an average sensitivity of 84.6%, average specificity of 95.5%, and average accuracy of 91.6%. This classification method shows better tissue classification in DBT images than currently available methodologies.

Application area

Software program for the automatic classification of breast tissue in 3D mammography or Digital Breast Tomosynthesis (DBT) imaging.

Advantages

Better tissue classification in DBT images than methods currently available.
Higher sensitivity and specificity compared to competing technology.

Institution

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