Automatic Tissue Classification of Breast CT Images for Breast Cancer Diagnostics

Published date: May 17, 2012

Technology description

platform technology for breast cancer detection and diagnosis based on x-ray computed tomography (CT) imaging.

Market Summary

The lifetime risk for women developing breast cancer in the US is one in eight. Currently, the most common test for detection of breast cancer is mammography, but one of its most significant limitations is its reduced sensitivity in women with dense breasts. Women with a large proportion of dense, non-fatty tissue are at an increased risk for developing breast cancer and dense breast tissue can often obstruct lesions. Mammography provides only a 2D image while CT scans provide a 3D image. In addition, dedicated X-ray breast CT can eliminate image artifacts caused by overlapping tissues and provides high-quality data in which differences in tissue density can be better distinguished than when using standard mammograms.

Technical Summary

Although CT imaging is quite reliable and accurate, it sometimes produces noise in which the scanner is incapable of differentiating between small high-density material and large low-density structures and the CT blurs sharp edges together as a result. To enhance the capabilities of CT imaging for breast cancer diagnostics, Emory University researchers have created an automatic system that involves a bilateral filtering approach to smooth and sharpen images while preserving the structural edges of breast tissue. This platform relies on a weighted average process that provides a highly sensitive classification of tissue composition based on tissue position that can effectively classify breast tissue into its three primary groups: skin, fat, and glandular tissue.

Advantages

Uses a multi-scale, bilateral filtering system to classify breast tissue based on composition, density and distribution.

Automated system distinguishes between breast fat, skin, and glandular tissue and eliminates the need for manual segmentation.

Institution

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