

THE BEST PROTECTION IS EARLY DETECTION

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Breast cancer is the most common, most frequently diagnosed cancer type and the second major cause of cancer death in women worldwide (Ahmedin *et al.*, 2011). Every one in eight women will develop breast cancer in their lifetime and for men it is about 1 in 1,000. According to Sri Lankan Cancer Registry 2005, breast cancers are the highest cancer type (25.4%) reported in Sri Lankan women.

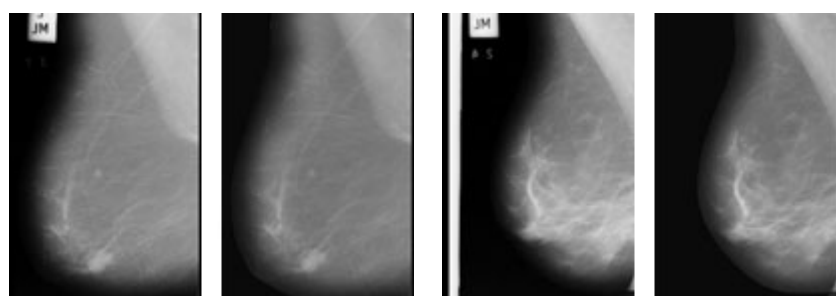
Breast cancer screening looks for signs of cancer before a woman has symptoms. Screening can help find breast cancer early, when the chance of successful treatment is best. American cancer society recommended to have an annual mammogram women who are elder than 40 years and have family history or high breast cancer risk factors.

Mammography is the most effective method of detecting cancer at an early stage, before the woman or a physician can feel it. Stellate lesion, mass and microcalcifications are the most common mammographic sign used for detection of breast cancers (Breast Cancer, 2014).

Retrospective studies have shown that the estimated sensitivity of radiologists in breast cancer screening is only about 75% (Bird, 1990). Therefore many Computer Aided Detection (CAD) techniques have been proposed to increase the accuracy.

Mammographic mass detection system developed by our group, mainly consist with two parts: "Automatic breast boundary segmentation of mammograms" and "Mammographic mass detection using statistical techniques".

The first part is consisting with preprocessing steps of the mammogram. In mammogram image, lot of external artifacts such as identification labels, markers and wedges are present. Removing them and extracting only the breast area is important before seeking for the breast abnormalities. Following figure shows the mammograms with artifacts and preprocessed mammograms with Gaussian smoothing algorithm, Attribute morphological operators, modified fast marching algorithm and gradient information of the mammogram (Wirth *et al.*, 2004; Yapa and Harada, 2007; Eli, 2009; The Mammographic Image Analysis, 2003).



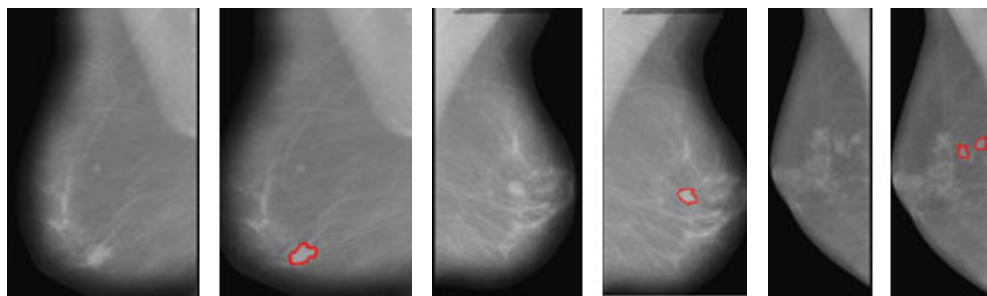
Before

After

Before

After

After extracting the breast region, program is looking for the masses in the mammogram. If any mass detected by the system will be highlighted on the mammogram. Contrast enhancing, Adaptive thresholding, feature extracting and artificial intelligence were used in the process (Singh *et al.*, 2011; Bottema, 2000). Following figure shows the mammogram and detected masses (The Mammographic Image Analysis, 2003).



At present time there is no reliable way to prevent breast cancer. However, it is much more treatable when detected at an early stage, which is why regular mammograms are very important in early detection.

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