Proposed smart UWB imaging system for breast cancer

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Medical screening methods have become increasingly important in diagnosing diseases nod assisting therapeutic treatment. In particular, early detection of breast cancer *is* considered as a critical factor in reducing the mortality rate of women. Within the various alternative breast imaging modalities being investigated to improve breast cancer detection, Microwave imaging is attractive due to the high dielectric property contrast between the cancerous and the normal tissue and has received significant interest over the last decade.

The research discusses using ultra wideband (UWB) radar for screening breast cancer. At the present time, X- ray mammography and Magnetic Resonance Imaging are the standard imaging techniques for detection and evaluation of breast cancer, but they have their limitations and drawbacks.

UWB radar utilities the difference in dielectric properties between a tumor and the surrounding healthy tissue. By interpreting t he scattered signals, it is possible to make a prediction on the localization of a tumor. The primary aim of this the research is to use ultra-wideband time domain technique in the screening of breast cancer, and investigate the use of the delay-and-sum

beamforming technique applied on both the receiver (Rx) and transmitter (Tx).

The work focused on experimental data based on breast tumor detection.

Neural Network with radial-basis functions and statistical technique using k nearest neighbor have been tested. Neural networks are efficient to solve problems where mathematical modeling of the problem is difficult.

Microwave imaging (MWI) is an attractive alternative modality for breast imaging. The procedure is comfortable, and the clinical system cost is a small fraction of the cost of an X-ray system, making it affordable for widespread screening. The procedure poses no safety hazards, and the potential is significant for detecting very small tumors in early stages of development.