

# Abstract

**Maha A. Sharkas**

## **Breast Cancer Detection Using Support Vector Machine Technique Applied on Extracted Electromagnetic Waves**

Breast cancer is one of the most common kinds of cancer, as well as the leading cause of decease among women. Early detection and diagnosis of breast cancer increases the chances for successful treatment and complete recovery for the patient. Mammography is currently the most sensitive method to detect early breast cancer however, the magnetic resonance imaging (MRI) is the most attractive alternative to mammogram. Manual readings of mammograms may result in misdiagnosis due to human errors caused by visual fatigue. Computer aided detection systems (CAD) serve as a second opinion for radiologists. A new CAD system for the detection of breast cancer in mammograms is proposed. The discrete wavelet transform (DWT), the contourlet transform, and the principal component analysis (PCA) are all used for feature extraction while the support vector machine (SVM) is used for classification. The system classifies normal and abnormal tissues in addition to benign and malignant tumors. A further investigation was implemented using electromagnetic waves instead of the classical MRI approach. A breast model was generated and near field data of electromagnetic waves were extracted to detect the abnormalities in the breast, especially the masses.