

Diagnosis of Breast Cancer using Gabor wavelet and Locality Sensitive Discriminant Analysis from Digitized Mammogram Images

Abstract

In this article, we will present an automatic method of classifying mammography images into three categories: normal, benign and malignant, in which image features are first extracted using Gabor filters and LSD analysis, and in the next step, using different classification methods. We tested the presented method on DDSM database data and show that these features achieved better results than other algorithms using K-NN classification algorithm. The presented system can be used in different places such as clinics and hospitals.

1- Proposed method

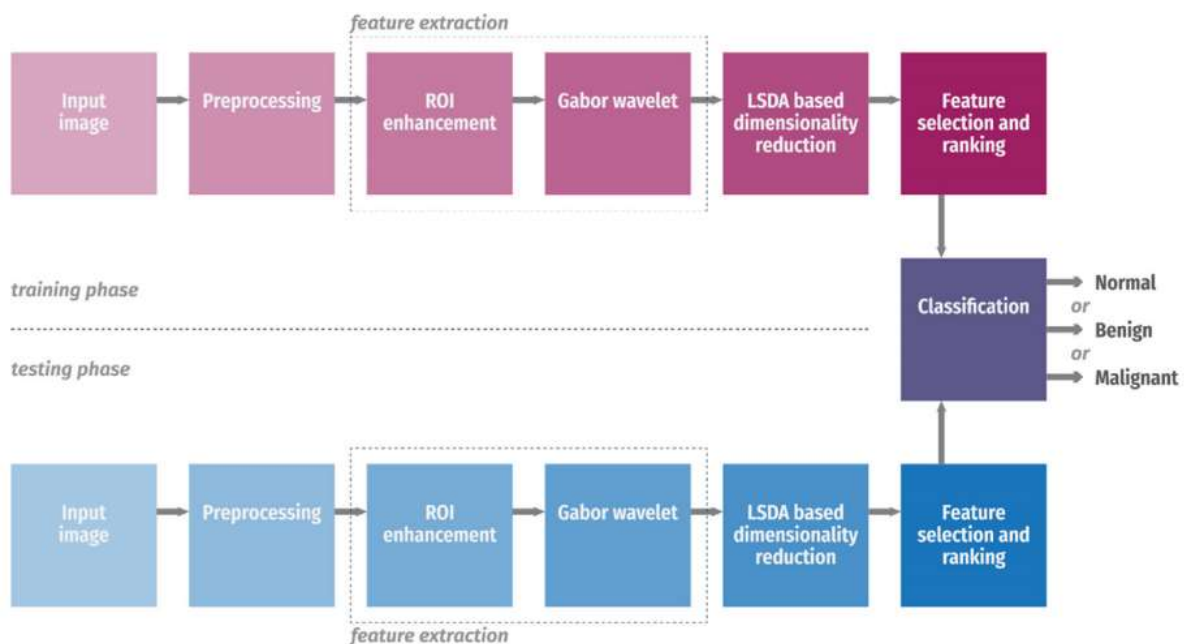


Figure 1. Proposed method

- 1-1- Pre-processing: Using average filter for smoothing and use global thresholding technique for getting regions of tissues (pectoral muscle). The obtained binary mask is projected on the original image and is smoothed again by applying average filter. Further, smoothed image is subjected to global thresholding with a threshold (Th2) of 0.5. In order to remove the pectoral muscle

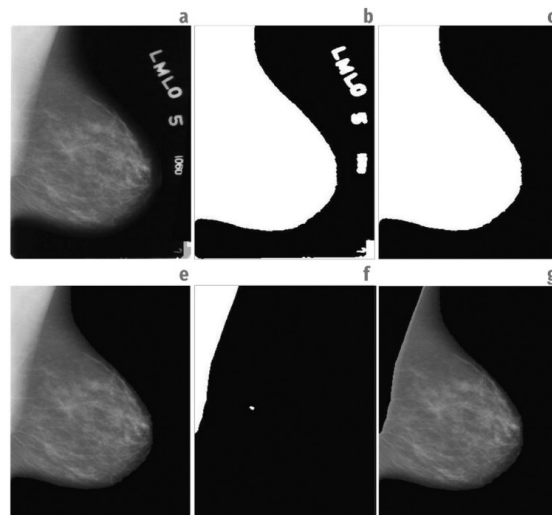


Figure2. Pre-processing steps, g: enhancement image

1-2- Feature extraction using Gabor filter

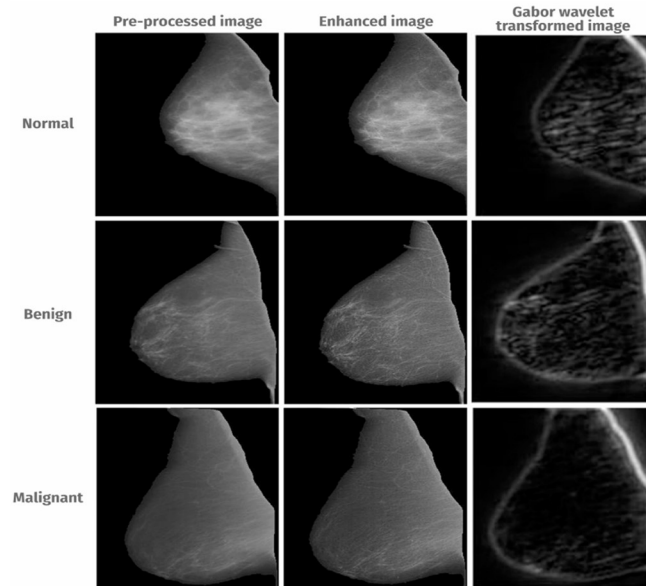


Figure 3. Extracted Gabor wavelet features from mammogram images.

1-3- Dimensionality reduction using LSDA

1-4- Feature classification using K-NN

2- Experimental results

Dataset: DDSM dataset (In src folder), 70% of each class for training and 30% for testing

Table 1. compare different classifier with different number of features

Classifier	Number of features	a
KNN	8	86.36
KNN	30	84.56
SVM RBF	30	85.30
SVM Poly 3	30	80

How to run:

- Open Main.m and run it.