CALCULATION OF TUMOR IN BREAST USING MAXIMUM LIKELIHOOD ESTIMATION

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ABSTRACT

Area can be detected in cancer images by using MLE (Maximum Likelihood Estimation). Also this helps to find out the area of tumor affecting portions. DWT (Discrete Wavelet Transform) also used determine the values. '0' is denoted by black in color and '1' will be shown as white in color.Breast cancer is the mostharmful cancer for women in the todayworld. Early detection of the breast cancer can reduce mortality rate. The breast Tumor are of two types first is Benign and second is Malignant, Benign Tumor which is non-cancerous and not life threatening and Malignant Tumor are cancerous and life threatening. Detection of breast cancer can be determined by using Digital Mammography. The classification of breast tumor is denoted as Malignant or Benign.

KEYWORDS

Benign, DWT, Malignant, Maximum Likelihood Estimations,

1. INTRODUCTION

Maximum Likelihood Estimation helps to determine the area of tumor affecting in breast tissue, with the help of database image. The Mean Square Error (MSE) and the Peak Signal to Noise Ratio (PSNR) are the two errors are helps to compare image and its compression quality. Area is calculated in pixel. The values will be determined by Mat lab software. Breast cancer is the most frequent cancer in women in all over the world. The disease is curable when it will detect as early possible. Screening is carried on the basis of mammograms, Here use x-ray images to reveal lumps in the breast. The calcium deposits can also shows the existence of a tumor.

Digital mammography is an efficient tool to detect breast cancer before clinical symptoms appear. Mammography is currently taken as a standard procedure for breast cancer diagnosis, various artificial techniques are used for classification problems in the area of medical treatment. Feature extraction ofan image is important step in classification of mammogram. Several types of feature extraction from digital mammograms including position feature, shape feature and texture feature etc. Textures are one of the important methods used for different applications.

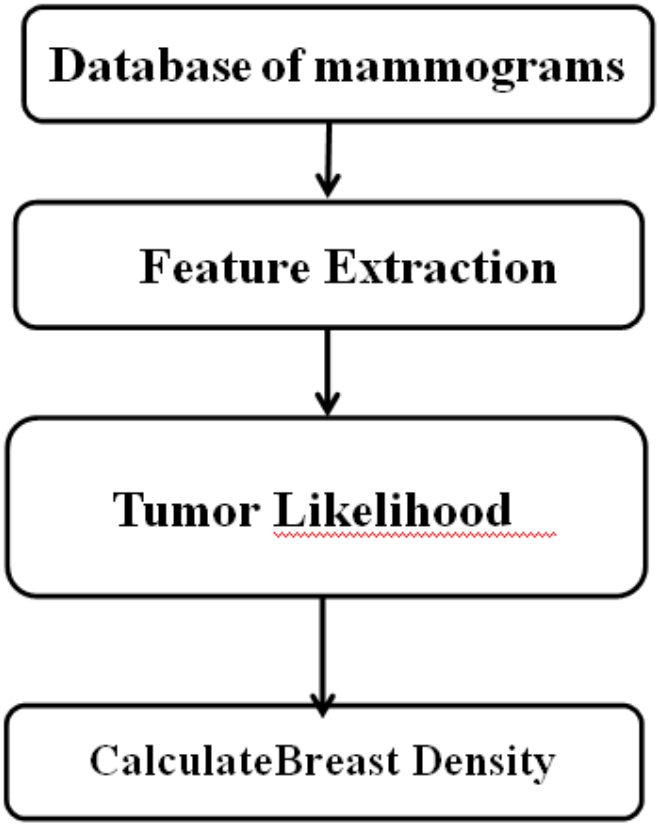


Fig. 1. Block Diagram for MLE

2. FEATURE EXTRACTIONS

Texture analysis of mammograms- The texture features of a mammographic image is analyzed based varies levels in it, i.e. high and low level. The various features, this has related parameters of mammographic image. The image helps to determine image as normal and cancerous. The parameter has various orders like first and second order.

MLE

The data is collected and the likelihood function of a model given the data is determined, the position to make statistical inferences about the populations, that is, the main probability distribution have underlies the data given in an image. Given that different parameter values index different probability distributions we are interested in finding the parameter value that corresponds to the desired probability distribution. The principle of Maximum Likelihood Estimation (MLE), originally developed by R.A. Fisher in the year of 1920s, this explains desired probability distribution is the one that makes the observed data that is ‘‘most likely,

The PSNR block computes the peak (SNR) signal-to-noise ratio, in decibels, between these two images. This ratio is used as a quality measurement between the original and a compresses the image. The higher the PSNR have better the quality of the compressed or reconstructed image.

The Mean Square Error (MSE) and the Peak Signal to Noise Ratio(PSNR)are the two error metrics used to compare images with compression quality. Squared error between the compressed and the original image is represented by MSE;PSNR represents a measure of the peak error.

3. PSNR VALUE FOR COLOR IMAGES

The different approaches used to computing the PSNR of a color image. Eye which is sensitive to lumain formation; which compute the PSNR shows color images. And converts image in to a color space that separates the intensity channel, such as RGB, gray etc. Maximum likelihood estimation, once data have been collected and the likelihood function of a model given the data is determined, one is in a position to make statistical inferences about the population.

The principle of maximum likelihood estimation(MLE), developed by R.A. Fisher in 1920s,states the desired probability distribution is one, which makes the data observed ‘‘most likely,’’ which means that one must seeks the value of a parameter vectors that maximizes the likelihood function The resulting parameter vector, which is sought by searching multi-dimensional parameter space called as MLE.

A mathematical expression is important in case of Maximum likelihood estimation which is known as Likelihood Function of the sample image. Which loosely speaks, likelihood of a set of data is the probability of obtaining that particular set of data, which given the probability distribution model. These expressions contain unknown model of parameters. some parameters that maximize the sample likelihood are known as the Maximum Likelihood Estimates or MLE's, and some parameters are minimize the function.

- Observations are ‘outcomes of random experiments’: the outcome is represented by a random variable (e.g. Y). A representation of Y is $y_{i.}$
- Distribution of outcomes given as probability distribution density.
- The same data (observations) can be generated by different models and the different observations may be generated by the same model. Probability model can predict an outcome and associates a probability with each outcome.

DATA PRE-PROCESSING

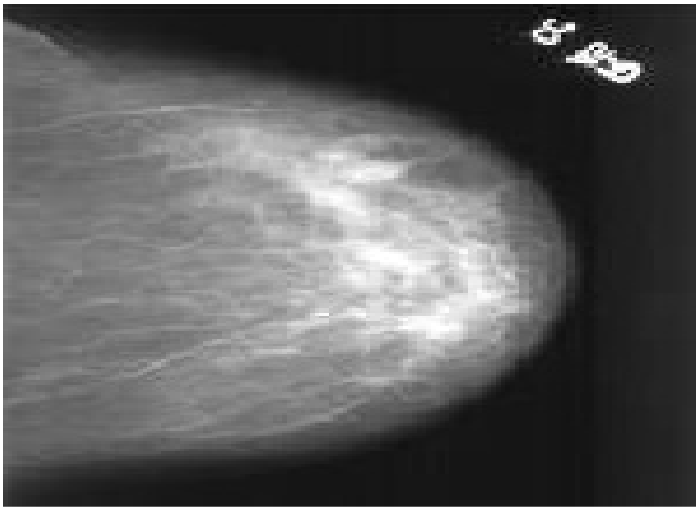
The preprocessing packages are provides common utility functions and transformer classes to change raw feature vectors into a representation that is more suitable for the downstream estimators.This analyzes images real and wavelet parts..Likelihood functions are used to test hypotheses about models and parameters. Data pre-processing is an important step in the data mining process. Pre-processing includes normalization, feature extraction, cleaning, transformation and selection.

4. CONCLUSION

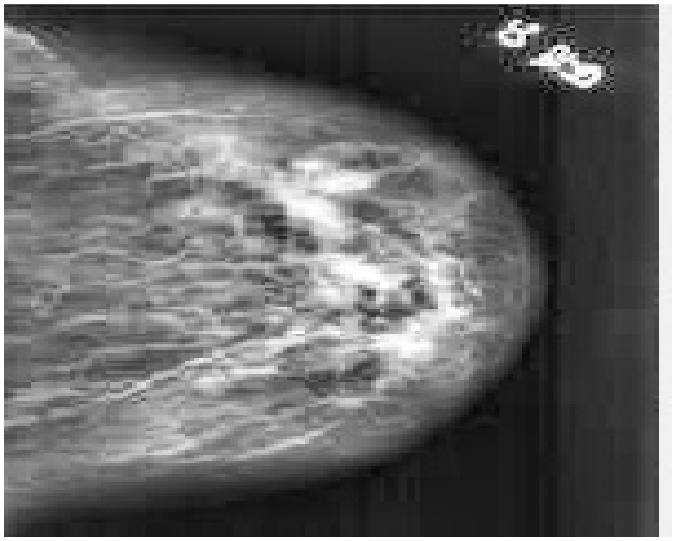
The Maximum Likelihood Estimation helps to determine the portions, which is affected by tumor. Other portions are denoted as normal cell. The area of this image is 19 pixels. And white color shows as tumor affected portions, this is applicable in Medical field. The advantages of this project is Low sensitivity, less tolerance of MSE(Mean Square Error), high Peak Signal to Noise Ratio and more accuracy for area calculation are its advantages.

5. **RESULT**

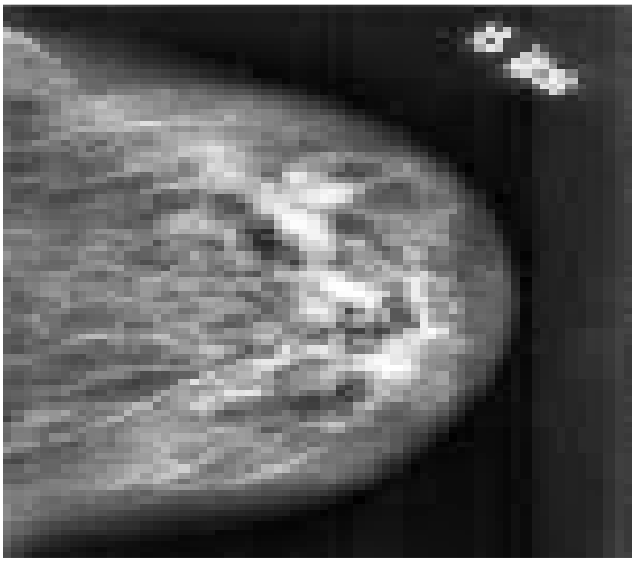
Differentiating normal cells and tumor cells and these also help to calculate the area of tumor affecting portions. It shows the area of calculation in unit of pixel Maximum Likelihood Estimation (MLE) and Discrete Wavelet Transform help to determine the area of tumor. Here giving different images (a) is a normal image. (b& c) which are indicated as wavelet transform, pre-processing. The image (d) shows tumor and non-tumor portions, black shows as normal image portions, and white shows as cancerous portions.



(a)



(b)



(c)

(d)

Fig.2. (a) Input image; (b) Pre-processing image; (c) Wavelet image; (d) Image differentiating tumor and non-tumor cells.

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