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# DETECTION OF BREAST CANCER USING NEURAL NETWORKS

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**ABSTRACT—** Breast tumor is the main cause for death amongst women. The aim of this project is plan and contrivance a MATLAB created image processing structure to extract features of breast cancer images in order to classify breast cancer through neural network from mammogram x-rays image (MXI). Breast Cancer (BC) happens several of the most common reasons of mortality including women international. Therefore, this development arranges the organization in preparing the finding of the disease computerized so that further and more citizens may obtain it diagnosed in the early hours so as become treated. Therefore, the experimental finding supports to protect the natural life of the ladies. Brest imaging is the elementary diagnosis for chest disease. It contain several articles that unhelpfully effects in finding of the breast tumour. The indications of recognition exist areas and small scale organization bands that are essential in quick exposure of breast tumour. This system has also the feature of online appointment booking (OAB) facility for patient with concerned radiologist (RD). This system will help the radiologist to detect early breast tumour and ~99% results has been enhanced. In addition we have categorized the breast tumor into three types Benign, Malignant and Normal.

**Keywords—** Breast Cancer, mammography, digital image processing, breast cancer detection, online appointment, neural networks, benign, malignant, normal.

## I. INTRODUCTION

Breast tumor defences as another prominent source of expiry in females of whole world. Conferring to American Tumor High Society, around 1 in 8 females will have chest disease in her life cycle and just five percent to ten percent of breast tumours appear in females with obviously characterized inherent linkage. Therefore, the quick finding will aid to have improved class of natural life, efficient medication and spiritual tranquillity of person effected by disease and extended family (Abdelsamea *et al.*, 2019). With a little amount of XRD graphs, mammography is great fundamental examination for breast disease and additionally data improved imagined inner particulars of the chest. Typically mammography pictures contains numerous items and noises and produces treatment pictures too tough to identify as well as recognize the disease at the initial phases(Bhattacherjee *et al.*, 2020).

Approach proposes Berbar mentions a wavelet established curve let technique for removing elements by mammogram categorization. Already removing elements, distinction reaching work 'stretchlim' has been utilized for pre-processing. There are many characteristics removed by the GLCM energy are, contrast, entropy, homogeneity, inverse difference moment, as well as sum average(Ragab *et al.*, 2019b).

In country of India and in all countries of world, breast tumor has become a fatal illness in addition most of the people are suffering by tumor and a review declares 1 in each 30 females hurt by such illness in their generation and thus essentially the development was original understood for the reason that the growth in cases of mammography including one thing that is most significant that if we may notice the Tumor at an initial level then there is an improved probabilities of it receiving preserved. Consequently such development sets an organization in producing the exposure of the tumor automatic as a result several persons may obtain this identified initial therefore get treated(Wang *et al.*, 2019).

Recently, due to huge amount of data, high computational power of Graphical Processing Units (GPUs), Deep learning clearly shows positive results in object identification and recognition in natural language processing Successful and medical image processing Deep learning based technique are sensitive to image acquisition setting, scanner types and the image pre-processing applied(Guan and Loew, 2019) showed that the evolution of breast cancer can be shaped by race, geographical location, and other risk factors(Alom *et al.*, 2019).

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Lack of early detection leads to thousands of women go through painful, lower survival rate and scar inducing surgeries. To mitigate this and similar challenges many studies have been undertaken using both conventional machine knowledge and cavernous learning built methods (Liu *et al.*, 2016).

Nowadays numerous methodology for classifying mammogram x-ray images of breasts. We have implemented adaptive mean filter (AMF) to eliminate noise via picture. Meanwhile this is best among all the filters and recognize excellent facts by noise. The AMF makes 3-D handling to check the pixels were affected from impulse noise in the x-ray view. The requires adaptation Filters classifies vectors as interference in the view of its neighbouring pixels by contrasting every pixel (Qi *et al.*, 2020).

The group magnitude is variable, and the upper contrast limit. The pixel that is dissimilar to the majority of its neighbours and that is not naturally associated with individual pixels to which it is comparable is defined as impulse noise.(Bhattacherjee *et al.*, 2020).

Such interference vectors are then replaced by the cumulative pixel quantity of the group pixels which have accepted the noise tagging test. Firstly We are transforming the picture into grey level copy utilizing rgb2gray() purpose then using adaptive mean filtering to the causing image as well as switched the image into unidentified digit 8 operating unit8() function (Ren *et al.*, 2015).

In this approach researcher pre-processed image. Subsequently we achieved GMM segmentation (Gaussian Mixture Model) upon the pre-processed image having total of sections 2 and figure of GMM elements 2 including highest number duplications 10. We completed k-means segmentation having k=2. After this we Applied HMRF-EM (Hidden Markov Random Field Model) as well as its Probability-Extension System (Miller *et al.*, 2018).

As there have been developed systems to detect the breast cancer detection bases on different variants and properties but still there is something to improve to identify it properly at the early stage to let the doctors treat the cancer accordingly. We have used the mammography for breast cancer detection and this process with Adaptive Median Filter, GMM Segmentation and Classification produce image with high resolution and with a size of 1024 by 1024(Osman and Aljahdali, 2020). The whole procedure work on these images to make them more clear that are affected by noise that reduce the quality of detection. Using manual detection of breast cancer can result Low accuracy detection and diagnosis. This system provide the exact Region of interest that will help to identify abnormality more effectively then already designed many systems(Mallick *et al.*, 2019).

This system preprocess the mammogram x-rays image of female patient breasts and classify the cancer stage like benign, malignant or normal using neural networks. So, the radiologist will recommend the medicine for the treatment(Ting *et al.*, 2019).

The effected female patient will book the appointment with the doctor online. On the appointment day the radiologist will take the mammogram x-rays image of female patient breasts and copy into computer system, where our software is installed so the radiologist will open the .exe file of MATLAB detection system, 1- mammogram image will be upload, 2- apply adaptive median filter, 3- apply GMM segmentation and 4- apply classifier. At the end radiologist will show the results. After detection the doctor will recommend the medicine for treatment and the patient will access the doctor report online (Han *et al.*, 2018).

## II. LITERATURE REVIEW

Breast tumor is a standout between the most commonly identified infections among females of the forming state upon the globes, after that this have also moved a leading resource of fatality. Various responsibilities have been yielded in data involving to the application of sample identification methods for breast cancer termination in soft tissue stage.(Bardou *et al.*, 2018).

'Hala-al-shamlan' & the company planned that remove the characteristic standards of the laboratory test breast tumor mammogram illustrations to categorize the breast cancer. These are determined sited important and classifying breast tumor element removal. There are two procedures. (Fernández-Ovies *et al.*, 2019). First procedure that is enhanced the difference of view. The second procedure segmentation that realizes the place for mass detection. They

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give us excellent conclusions. Such calculations were the attain characteristics required in each element removal. Martin and his co-worker suggested the technique for identification of bulk upon digitized mammograms (Vijayarajeswari et al., 2019). They applied K-means gathering sum for image distribution and indistinct level co-event lattice to describe and disruption the exterior separated forms into photograph. Gathering that such organizations had been achieved to out of Support Vector Machines (SVM) that is separate them into two assemblies; applying the structure and configuration descriptions, non-masses as well as masses. The deal precision obtained by such scheme was 85 percent.(Chougrad *et al.*, 2018)

The "Vishnu-Kumar-K. Patel" & the company to planned a mammogram x-rays illustrations to tumor finding from utilizing image improvement systems (Khan *et al.*, 2019). There are various methods applied in improvement of system like spatial area and frequency area. The repetition area flattening improving method that offered, the influence is examined to sympathetically improve mammographic photographs. These can be used contrast improvement process and utilizing Gabor filter. Gabor filter is utilized to achieve excellent image. Researcher got the mammogram view and gives various filter rates afterward utilized of PSNR system and originate obtainable improved consequences into arithmetical standards. That outcome images operated in innovative ranges that can be of communicative redistribution.

Merging Gabor considering with fast Fourier shift and overlap cover distribution proved to be a significantly effective methods for removing out noise and informing boundaries, along such routes enhancing the signal to-commotion level. Superimposition of photographs altered utilizing different methods into specific photograph within suggested to successfully improve the perceivability and simplification of the detection of advantageous records to the eye of human difference with unique procedures for breaking. Athanasiadis I. Emmanouil and his company planned mammographic photograph enhancement applying wavelet based management as well as scatter diagram levelling.(Fernández-Ovies *et al.*, 2019)

The determination of this learning is to explore the effectiveness spectral transition from processing the spatial domain transformation (SWT) aspect quantities having the sigmoid purpose and similarly histogram Equalization Mapping Functions (HEMF). Researchers got the six factors and improving the illustrations as well as obtained the outcome 91 percent across the entire photographs. This had been observed that the sigmoid wavelet-based network matched excellent experience of the bosom coating, the thoracic power, ferries, layers, including ways, although this enhanced the split of the photograph description of normal fatty bosoms in a magnetic stage.

Wener Borges Sampaioand his company recommended to Exposure of bulks in mammogram descriptions utilizing CNN, geostatistical tasks as well as SVM (Vijayarajeswari *et al.*, 2019). Such effort shows a computational method which supports energy accept bosom bulks in mammographic photographs. The main phase of the technique plans to enhance the mammogram photograph. Such phase includes in discharging disputes out of inseparable, reducing disturbance and emphasizing the interior configurations of the bosom.(Domingues *et al.*, 2015) After that, nerve cells structures utilized to portion the areas which can cover crowds.

Such regions have their own figures studied via structure descriptors (irregularity, complexity, width, indirect disagreement as well as round texture) and their compositions divided via geostatistical abilities. Bolster vector devices are utilized for grouping the applicant as areas non-masses or masses, having affectability of eighty percent, levels of 0.84 fake positives every print including 0.2 incorrect negatives every photograph, and the region beneath the (ROC) 0.87.M. bend Sundaram worked with his coworker. upon scattered diagram Improved Regional Conflict Development for mammogram prints.(Ellisen, 2017) These are used various development methods and get unique outcomes and change the regional histogram. Gap shift for mammogram photographs is introduced. The suggested work provides a better-quality variation enhancement as well as data safety for mammogram print.

The examination results are comparably more efficient not including trading off separation additionally exciting data. For

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example this utilizes the data histogram that does not modification fundamentally, the planned effort does not show relics within the outcome. The recommended method is more appropriate for the broad collection of mammogram prints of oily, oily glandular and wide glandular mammogram photos along with its implementation is analysed for separately of the 22 quantities of Mias mammogram images including micro classification. The independent and focus procedures are also comforting. Such effort can be associated with exam this one implementation for mammogram prints during locality of demand and this technique may support for separating of small categorization in mammogram. This is obvious that the future context have increased the perceptibility of small groups perform into mammographic prints.

"Indra-Kanta-Maitraand" likely to study with his co-worker. copy utilizing method designed for pre-processing of arithmetical mammogram.(Jorgensen *et al.*, 2016)These can be applied form computations for Personal Computer help out place. Such approximation is utilized to decrease demand, boundary-shadowing influence, completely recognize pectoral muscle as well as suffocate the pectoral muscle effectively with no dropping every data by the drifting leftovers of these mammogram(Heaphy *et al.*, 2011).The subsequent mammogram may be manipulated further than for the automated changes via the standard detection of person bosom similar to group, included masses, surmised bulks and Eleven additional not extremely described masses, defined wounds, irregularity analysis and many more. Additional effort can be synchronized to get along with smoothening the muscles pectoralis breakdown(Geras *et al.*, 2017).

Mohamed Meselhy Eltoukhy and his company suggested an arithmetical established element removal technique for breast tumor identification in arithmetical mammogram utilizing multi resolution interpretation (Kourou *et al.*, 2015). These can also be applied multi-resolution interpretations, wavelet or curvelet change. The focus removal method is produced in daylight of the measurable t-test approach. The structure is establishing the components such as displayed via its capability to isolate the grades. At that time, an energetic utmost is combined with enhance the volume of features, that can play the finest representation precision level. The game strategy demand percentage is made development (Yurttakal *et al.*, 2019).

Bolster vector machine (SVM) is applied to coordinate among the conventional and irregular soft tissue and to recognize kind hearted as well as hazardous cancers. Utilizing curvelet measurements, the collecting plan level go to 95.98 percent to collecting during common and irregular including 97.30 percent to make idea if the cancer is helping benign or harmful. Nawazish Naveed and his classmates suggested to Substantial and signal noise filtering by breast mammogram descriptions utilized two segments, noise filtering and noise detection. For finding justification, neural system is used that effectively differentiate the noise by extremely degraded pictures. (Mallick *et al.*, 2019). The planned scheme has been tried upon NaCl and pepper as well as quantum disturbance appear in mammogram photographs. Growth indicator to insist ratio and fundamental comparability record amount are utilized for analysis of future structure with unique active approaches. Research indicates that recommended outline give improved outcomes as stand out via current procedures.

Breast Tumor utilizing MATLAB program is introduced at this time, MATLAB is a programming-presentation useful-processing language. This combines calculation, vision and software development the simple-to-treat atmosphere throughout that popular statistical data describes challenges and results(Ragab *et al.*, 2019a).

## III. METHODOLOGY

Using matlab software and the image processing techniques available by the system for breast cancer detection moreover the Raw Data used in this project is about 30 sample including normal, benign and malignant, all of the raw data entered to a preprocessing stage in order to be viewed and to be filtered from noise, then adjusting, the segmentation progress is applied in order to detect tumor cells, after that feature extracted for classification.

We applied AM filter to eliminate noise from x-ray mammogram. Meanwhile it is improved among all the filters and differentiate adequate specifics from noise.The Adaptive

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Median Filter (AMF) executes spatial processing to regulate which pixels in x-ray copy (image) have been pretentious by instinct noise. By comparing each pixel in the image to its surrounding neighbouring pixels, the AMF categorises pixels as noise.

The region's mass is flexible, as is the measurement point. Instinct noise is defined as a pixel that is distinct from a typical neighbouring pixel, as well as being not anatomically aligned with those pixels to which it is identical.

The effected pixels are then changed with median pixel value of the pixels in the adjacent that have conceded the noise tagging assessment. Firstly the image transform into grey level image using rgb2gray () function, after that applying the AMF to the resultant image and then transformed the image into unnamed number 8 using unit8 () function.

**Normal Case Conditions:**

Normal cancer condition is describe here after preprocessing of mammogram x-rays image in MATLAB.

INPUT:

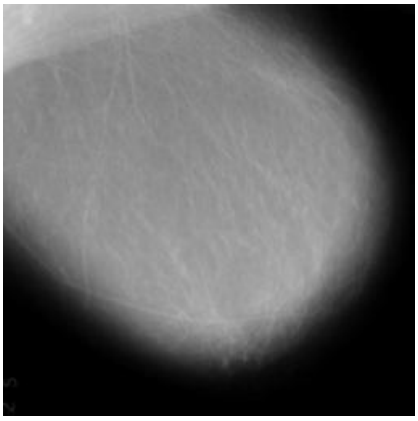

**FIGURE 1: NORMAL MAMMOGRAM**

OUTPUT:

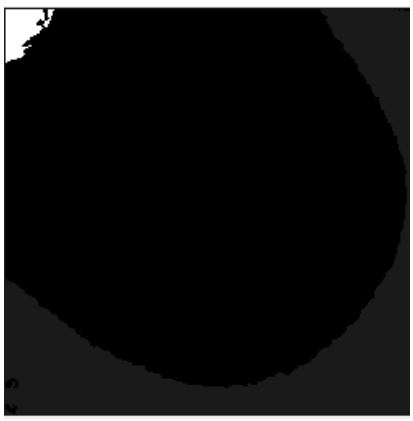

**FIGURE 2: NORMAL CASE RESULT**

**Benign Case Conditions:**

Benign cancer condition is describe here after preprocessing of mammogram x-rays image in MATLAB.

INPUT:

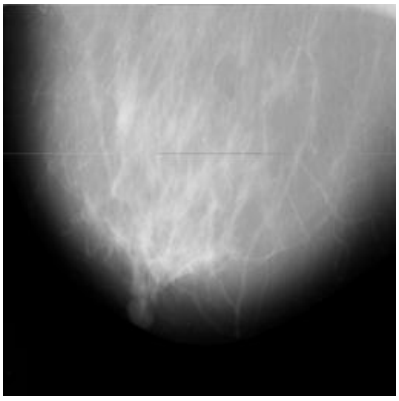

**FIGURE 3: NORMAL MAMMOGRAM FOR BENGIN**

OUTPUT:

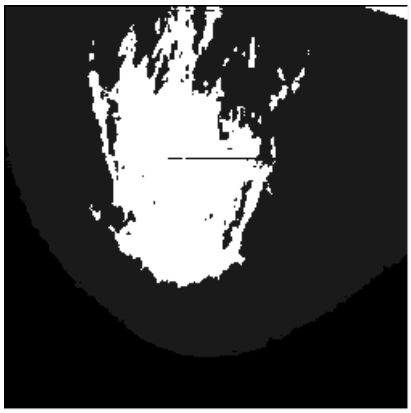

**FIGURE 4: BENIGN CASE RESULT**

**Malignant Case Conditions:**

Malignant cancer (Dangerous) condition is describe here after preprocessing of mammogram x-rays image in MATLAB.

INPUT:

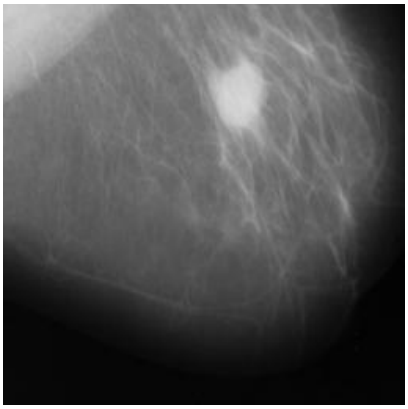

**FIGURE 5: NORMAL MAMMOGRAM FOR MALIGNANT**

OUTPUT:

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FIGURE 6: MALIGNANT CASE RESULT

In that way we pre-processed mammogram. Then executed GMM segmentation (Gaussian Mixture Model) on the resultant image with integer of areas 2 and integer of GMM modules 2 and all-out number repetitions 10. We applied k-means segmentation k=2. And the executed HMRF-EM (Hidden Markov Random Field Model) and its E-M Algorithm.

**Adaptive Median Filter (AMF):**

AMF implements spatial dispensation to observe which pixels in mammogram contain been exaggerated by framework noise. The AMF categorize pixels as sound by relating individually pixel in the picture to its close pixels. Middle filtering follow this basic instruction. The AMF be usually used to decrease the noise in an image, as signify sift.

While, it frequently do a good work than the mean filter of preservative valuable aspect in the representation. These type of sieve from the kind of edge stabilizing horizontal filter which are non-linear riddle.

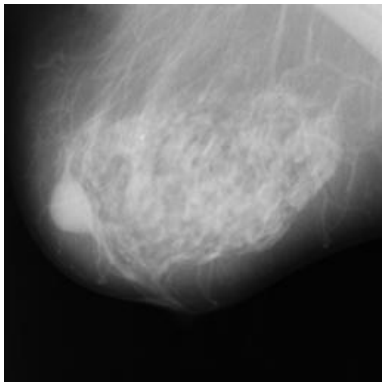

FIGURE 7: EXAMPLE OF MAMMOGRAM AFTER APPLYING ADAPTIVE MEDIAN FILTER

**Gaussian mixture model (GMM):**

The model of the Gaussian mixture (GMM) is a best tool for image segments and classification. Though, one main restriction of GMM is that it does not reflect spatial info. A GMM assumes that the observed data is made up of a mixture of several Gaussian distributions. These individual distributions (referred to as mixture components) may be given different means and variances.

A GMM Segmentation method for the finding of water superficial floats. The GMM is an extensively used method for the background removal and the moving substances detection.

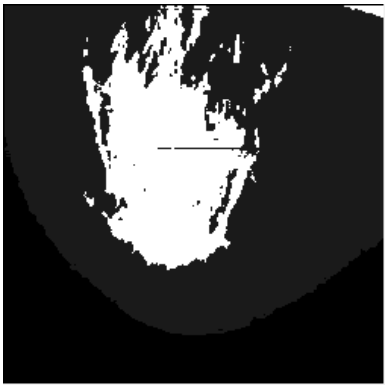

FIGURE 8: EXAMPLE OF MAMMOGRAM AFTER APPLYING GMM SEGMENTATION

**PNN Classifier:**

A PNN is a feedforward neural network, which is broadly used in classification and pattern acknowledgement problems. In the PNN algorithm, the father possibility distribution function (PDF) of individually class is rough by a Parzen gap and a non-parametric function. Representation categorization analyses, mathematical properties of the numerous picture structure and organize data into groups.

These feature-space surfaces are used for the subsequent test process to categorise image structures. The explanation of training classes is tremendously significant module of the classification process.

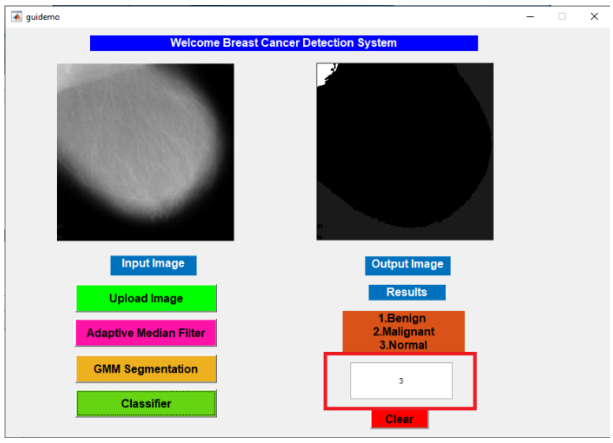


FIGURE 9: PNN CLASSIFICATION RESULT

**Malicious and Benign muscles in Breast:**

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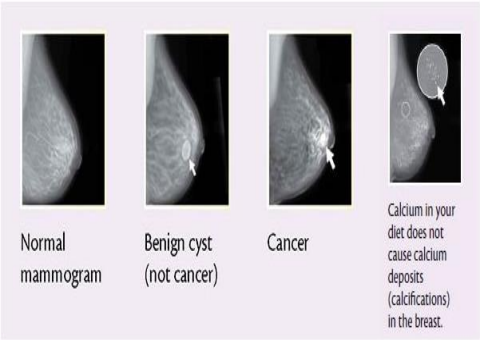


**FIGURE 10: THIS PICTURE DESCRIBES THE VARIANCE BETWEEN MALICIOUS AND BENIGN MUSCELS IN BREAST**

**Online System and User Authentications:**

The main purpose of online system and user authentications for admin, doctor (radiologist) and patient are for data security and is time saving. The online system will communicate with admin, doctor and patients. Admin control all the management like handling doctor's data, patient data and manage the appointment time, manage treatment facilities, and so on. The admin has a significant role in the administration of this online hospital management structure.

For the user side, the users could either be a patient or a doctor. The user can log in as a doctor, check their appointment, patients, timings, and so on. Similarly, to log in as a patient, the user should have their login id and password for this hospital. If the patient doesn't have them, they can first register as a new patient. The patient can check their appointment times, prescription records, treatment records, and so on.

**About system:**

This Online System is in PHP, JavaScript, and CSS. Talking about the features ontains the admin section and the user sec ng's, updating, managing doctors, patients, appointments and editing treatment facilities are from the a e main feature of this coordination is to offer to get consultation from a doctor on internet (online) instead of wasting time in hospital. The design of this syst so that the user won't get any difficulties while working on it.

- Admin
- Doctor/R
- Patient

All three actors are connected with each other via online website, hospital. Admin, doctor and patients login into the system via user name and password, all actor panels have many features. Online system will save all the record of admin, doctors and patients. Record could be access at any time. The patient download the radiologist report and treatment report.

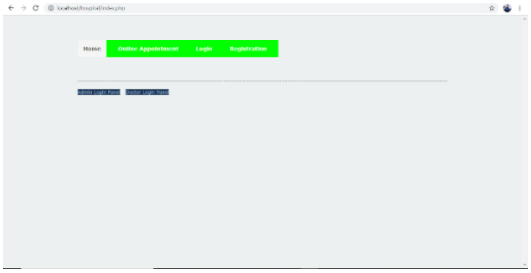

**FIGURE 11: ONLINE SYSTEM GUI**

## IV. DATA ANALYSIS & RESULTS

**System Block Diagram:**

The system is consist of preprocessing block that filter image from noise and adjust the contrast to insure that the image is ready to be entered to the feature extraction, from the extracted features a comparison between these features is applied to classify the breast cancer type the diagnosis results then is displayed.

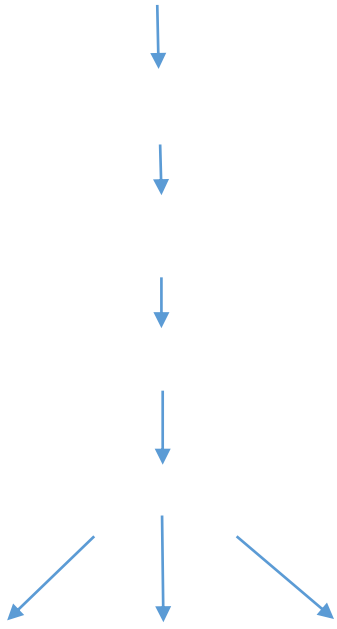

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FIGURE 12: SYSTEM DIAGRAM

**Block diagram description:**

**1- Image**

A sufferer's breast is placed on a smooth supportive platter for the mammogram x-ray photograph and flattened with a similar platter called a paddle. An x-ray system produces a slight x-ray blast, which travels across the breast to a sensor located on the opposite.

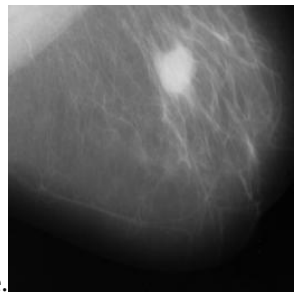

FIGURE 13: MAMMOGRAM X-RAYS

**2- Preprocessing**

In this stage the image will be loaded into Matlab and a noise will be removed by Adaptive Median Filter, then GMM Segmentation applied, then Intensity & GLCM Feature Extraction applied and then PNN Classifier applied to get the final result.

**Preprocessing steps**

a) Load original image: The original image shown in fig-14 will be loaded into matlab.

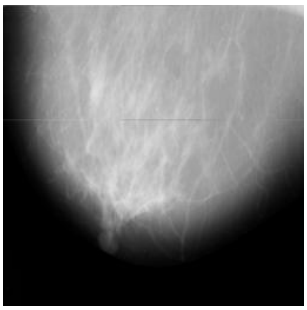

FIGURE 14: ORIGIONAL IMAGE

**MATLAB GUI:**

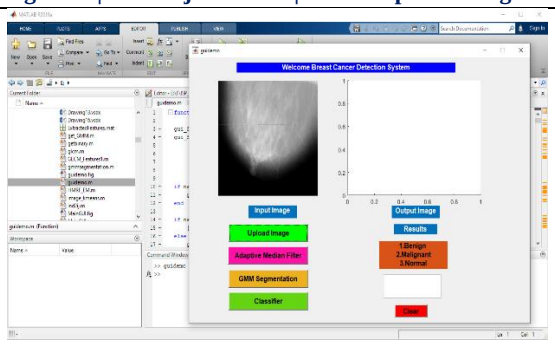


FIGURE 15: ORIGIONAL IMAGE UPLOADED INTO MATLAB

a) Apply adaptive median filter:

This filter use to detect each part of the image by creating a scanning matrix 3x3 in order to find the high medium and low pixel color in order to adjust the matrix to the medium of the colors and remove the noise as presented in fig-16.

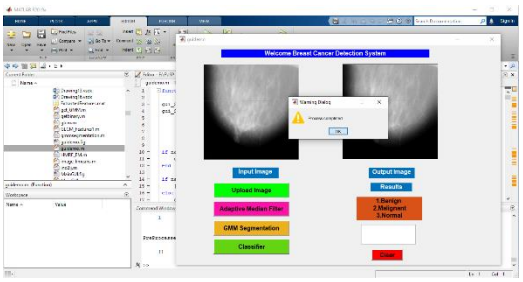


FIGURE 16: AFTERWARD APPLYING AMF

b) GMM Segmentation:

Gaussian mixture model (GMM) is a type of clustering algorithm that falls under the umbrella of unsupervised machine learning techniques. As the name indicates, GMM models each cluster to a Gaussian distribution with specific mean and variance in fig-17.

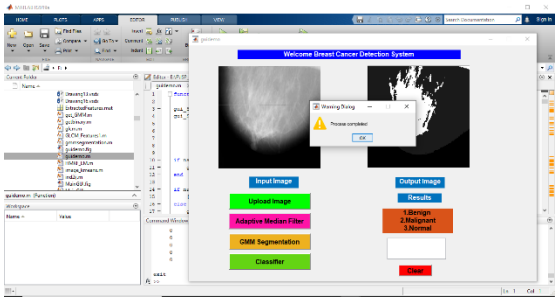


Figure 17: APPLYING GMM SEGMENTATION

**3- Feature Extractions**

In this stage an extraction of features was selected and applied an input to the NN. As many categories of feature abstraction from ordinal mammogram:

- Place feature.
- Form feature.

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- Consistency feature, which it used here.

**Texture features**:

- The consistency of a mammogram print is inspected established on the variance between extraordinary and small grey stages on it.
- Consistency is the capability to differentiate among ordinary and irregular cases or outlines.
- It's Provides information about textural characteristic of the image.
- And have 2 types:

**First order (intensity based):** Consistency quantity figures calculated from a separate pixel and do not contemplate pixel neighbour relationship. Mean value, standard deviation was measured.

- **Mean value**

Mean give the ordinary intensity values of an image. Mammogram x-rays image that hold micro classifications have an advanced mean of those of regular images.

- **Standard Deviance**

Standard deviance is a constraint thoroughly related with the mean. It states to the distribution of values in a mammogram x-rays round of mean.

**Second order (Grey Level co-occurrence matrix [GLCM]):**

Consistency could be categorized as the space distribution of grey scale stages in nearby so processes the association between adjacent pixels.

**4- Classification:**

For classification two types of neural networks was used (feed-forward and back-propagation NN) to classify that results of the breast cancer.

**5- Creation network:**

The following specific factors identify our neural scheme.

Net = new fit (inputs, objectives);

Work is given bellow:

Contributions of the neural scheme anywhere this comprises two essential characteristics established (intensity based, GLCM) removed by the photograph.

Confirmed goal for every single phase completed via one dimensional second selection only one component of that array have significance 'one' and additional features are allocated to 'zero' that's to divide the required level by next ones.

**6- Training and Analysis Platforms:**

The research and the considerations below are exploited to train our genetic algorithm: net = trains (system, parameters, and objectives);

1. Net: a genetic algorithm that was previously developed.
2. Inputs: input and output of the genetic algorithm generated as previously described.
3. Identifies: the genetic algorithm indicated as goal.

**7- Diagnosis**

The diagnosis will be done to compare between the two neural networks using measures for performance.

**8- Measures for Performance:**

The quantity of various procedures are generally applied to estimate the implementation of the recommended technique. Such methods involving categorization, understanding, specificity, Mathew's association coefficient (MCC) are analysed by uncertainty medium. This takes the – 1(inverse assumption) advantage to +1(perfect forecast). Real and projected levels of the technique being offered are decided by the structure of uncertainty.

**True Positive (TP)** – Numbers of all samples that are accurately named as tumor by the algorithm.

- **False Positive (FP)** – List each study that is mistakenly referred to as a tumour from its method, although popular.
- **True Negative (TN)** – List of each examination that is correctly defined as being normal in the method.
- **False Negative (FN)** – List each study that is incorrectly identified as normal when it is a malignant tumor in the process.
- **Benign Case Result:**

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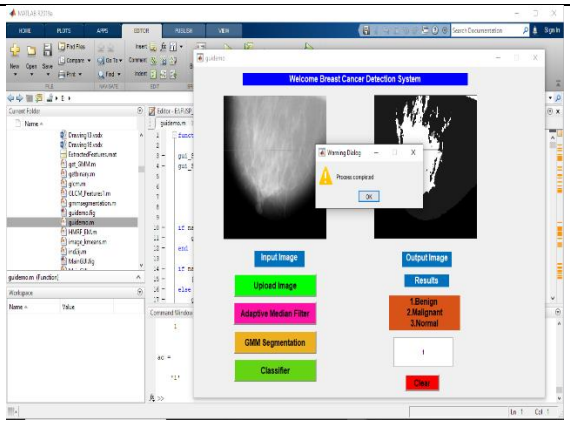


**FIGURE 18: BENIGN CASE RESULT**

### 9- Malignant Case Result:

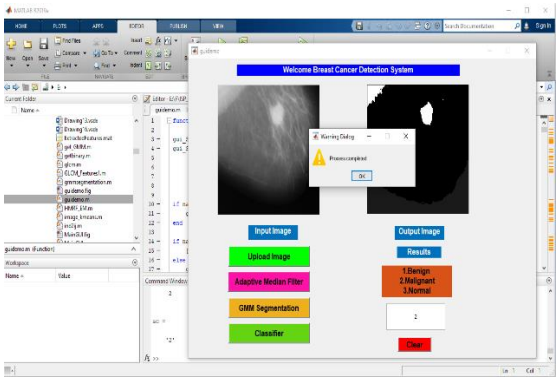


**FIGURE 19: MALGINANT CASE RESULT**

### 10- Normal Case Result:

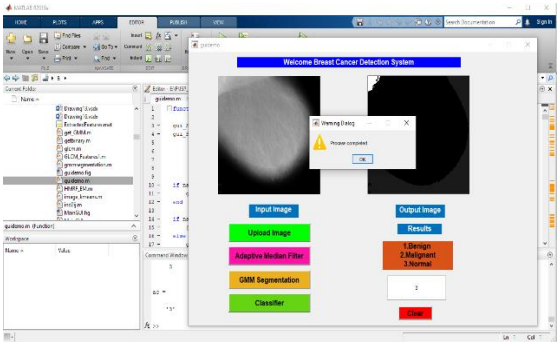


**FIGURE 20: NORMAL CASE RESULT**

## V. DISCUSSION

This system has been fully satisfy all the assumption, dependencies and it gives appropriate accurate results that we has been decided before development.

## VI. CONCLUSION

This suggested technique is very less cost like this may be fulfilled in universal processer. Such research paper is established on graphic exposure scheme of the handled mammographic x-rays view. In upcoming era a real time scheme could be applied via appropriate data attainment software and hardware GUI with digital mammographic schemes. Afterward analysis the two removing approaches on two NN it was originate that the correctness of feed forward (FF) NN is 94.11% correct than the back propagation (BP) NN that is 92.00%.

## ACKNOWLEDGMENT

There seems to be a race of life in the current world of rivalry within which able to come forward can thrive. With this willing we joined this particular project so we would like to thank everybody without whom this thesis would not have been possible: First and foremost, we would like to thank almighty Allah for giving us the strength to complete this research successfully. We would really like to express our appreciation to our supervisor, Dr. Hameedur Rahman, for the supportive feedback, feedback and participation in this research project through learning process. We understand that this thesis may be made electronically available to the public.

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## APPENDICES

We calculate the three level of tumors:

1- Benign
2- Malignant
3- Normal

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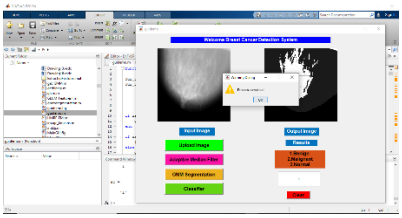
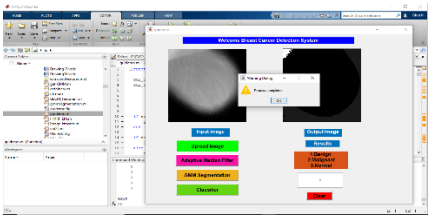
These are three level of results in this research, the radiologist can easily diagnose the breast tumor in female patient.

The results are following:

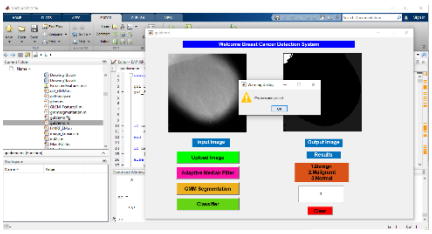
**1- Benign**



**2- Malignant**



**3- Normal**



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