CANCER DETECTION USING IMAGE PROCESSING pdf

1: Endometrial cancer detection using Image processing - MATLAB Answers - MATLAB Central

The picture shows a digital mammography of a breast. Siemens researchers in Portugal hope to detect breast cancer more reliably in the future using a new statistical detection method.

Cancer cells can be carried away from the lungs in blood, or lymph fluid that surrounds lung tissue. Lymph flows through lymphatic vessels, which drain into lymph nodes located in the lungs and in the center of the chest. Lung cancer often spreads toward the center of the chest because the natural flow of lymph out of the lungs is toward the center of the chest. As for the stages, in general there are four stages of lung cancer; I through IV. One of the major reason for non-accidental death is cancer. It has been proved that lung cancer is the topmost cause of cancer death in men and women worldwide. The death rate can be reduced if people go for early diagnosis so that suitable treatment can be administered by the clinicians within specified time. Cancer is, when a group of cells go irregular growth uncontrollably and lose balance to form malignant tumors which invades surrounding tissues. Cancer can be classified as Non-small cell lung cancer and small cell lung cancer. The various ways to detect lung cancer is by the use of image processing , pattern recognition and artificial neutral network to develop Computer aided diagnosis. In this project we use the techniques and algorithm used in image processing to detect cancer in three types of medical images. In this system first of all the medical images are recorded using a suitable imaging system. The images obtained are taken as input for the system where the image first go through the various steps of image processing like pre-processing, edge detection, morphological processing ,feature extraction. Lung cancer which is among the five main types of cancer is a leading one to overall cancer mortality. Cancer is a serious health problem among various kinds of diseases. Uncontrollable cell development in the tissues of the lung is called as lung cancer. Lung nodule is an abnormality that leads to lung cancer, characterized by a small round or oval shaped growth on the lung which appears as a white shadow in the CT scan. These uncontrollable cells restrict the growth of healthy lung tissues. If not treated, this growth can spread beyond the lung in the nearby tissue called metastasis and, form tumors. So there is a need of pre-diagnosis system for lung cancer disease which should provide better results.

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2: Breast cancer detection improved with image processing

Recently, image processing techniques are widely used in several medical areas for image improvement in earlier detection and treatment stages, where the time factor is very important to discover.

Breast Cancer is one of the significant reasons for death among ladies. Many research has been done on the diagnosis and detection of breast cancer using various image processing and classification techniques. Nonetheless, the disease remains as one of the deadliest disease. Having conceive one out of six women in her lifetime. Since the cause of breast cancer stays obscure, prevention becomes impossible. Thus, early detection of tumour in breast is the only way to cure breast cancer. Using CAD Computer Aided Diagnosis on mammographic image is the most efficient and easiest way to diagnosis for breast cancer. Accurate discovery can effectively reduce the mortality rate brought about by using mamma cancer. Masses and microcalcifications clusters are an important early symptoms of possible breast cancers. The image for this work is being used from the DDSM Database Digital Database for Screening Mammography which contains approximately cases and is being used worldwide for cancer research. This paper quantitatively depicts the analysis methods used for texture features for detection of cancer. These features are further compared and passed through Back Propagation algorithm Neural Network for better understanding of the cancer pattern in the mammography image. Copy the following to cite this article: Giri P, Saravanakumar K. It can be detected by clinical breast examination, yet the detection rate endures to be very low. Additionally, the abnormal areas that cannot be felt can be quite challenging to check using traditional techniques but can be easily seen on a conventional mammogram or with ultrasound. Mammography is currently the best method for detecting breast cancer at its early stage. The problem with mammography images are they are complex. Thus, image processing and features extraction techniques are used to assist radiologist for detecting tumour. Features extracted from suspicious regions in mammography images can help doctors to discover the existence of the tumour at real time thus speeding up treatment process. Detecting breast cancer can be quite a challenging job. Specially, as cancer is not a single disease but is a collection of multiple diseases. Thus, every cancer is different from every other cancer that exist. Also, the same drug may have different reaction on similar type of cancer. Thus, cancer vary from person to person. Depending on only one technique or one algorithm to detect breast cancer may not provide us with the best possible result. As one cancer differ from another, similarly every breast appears differently from another. The mammography image can also be compromised if the patient has undergone some breast surgery. Breast Cancer has been a big topic in research field for the last two decades. It has been well funded medical research topic across the globe. Many people have been cured of it, due to early detection. Still the progress in diagnosis and treatment for it remains expensive and time consuming. So, a lot of work is still left to be done. Some of the reasons for the challenges in automated detection as follows. First to begin with, the object of interest can be to an extraordinary degree small, inciting to potential miss-identification. Second, unique sizes, different shapes, and variable appropriations of microcalcifications show up in mammograms, therefore, sample matching seems to be impossible. The refinement between suspicious reaches and their enveloping tissues can be thin. Fourth, the thick tissues as well as skin thickening, particularly in young women, cause suspicious territories to be practically undetectable. Finally, dense tissues may easily be confused as calcifications, resulting in high false-positive cases. Literature Survey Detecting macrocalcification in dense breast tissue can be a difficult task as both tends to depict white pixel on the mammogram. The number of false positive cases on dense breast tissue are higher. Indicators of cancer symptomare generally, masses and microcalcifications. Detecting masses are more challenging task than detection of micro-calcifications. As their size and shape varies in large variation and they often exhibit poor image contrast. The utilization of grouping frameworks in classification and pattern recognition system, in medical diagnosis, specially cancer diagnosis are growing rapidly. Evaluation and decision making based on machine learning for medical diagnosis is a key factor. Intelligent classification algorithm may help doctor in identifying symptoms that may not be possible through traditional approaches [8]. Any Image processing and analysis applications would require a unique function for alignment of feature

for classification and segmentation. Mainly texture features and statistical features are of more suitable in pattern recognition area to find this alignment. Screening Mammography is the easiest and affordable way to diagnosis for breast cancer. Finally finding the size distribution of tissues in an Image without explicitly segmenting each object [5]. Digital mammography is the standard procedure for breast cancer diagnosis, various classification problem is applied on the digital mammography image. Various features are extracted as per standard procedure for breast cancer diagnosis. These features are calculated from the sensitive part of the breast to avoid any unwanted features to affect the classification problem. All the features extraction techniques are applied on the stored database image [13]. The techniques in computer aided mammography includes image pre-processing, image segmentation, feature extraction, feature selection and classification. Further developments are required to extract more features to find pattern in tumour to have a better understanding on them. Texture analysis method can be used to classify between benign and malignant masses by means to identify the micro-calcification in the mammography. The new research analysis and techniques to find the cancerous cells and eradication methodology to cure the cancer from any person. However, even cancer cells have evolved them to hide from drugs and medications. As cancer cells are immortal they are not affected by the immune system. There is a research for curing the cancer tumour, the methods are as follows. There is also a vast door for direct treatment of cancer through gene interference or activation. Artificial Immune System Artificial Immune Systems resembles the natural properties of our biological immune system. Natural immune system has the property to pattern matching which is used to distinguish between normal and abnormal cell [19]. Nano Technology Nano technology can give fast and delicate location of cancer cells in the breast tissues. Empowering researchers to identify molecular changes not withstanding when they happen just in a smaller amount of cells. All the images of the database are of the same size, if image size differs from others then the image enchantment algorithm is applied to match the image resolution. These images are filtered through Noise removal algorithm. Then, they are filtered and adjusted to increase pixel intensity. Segmentation The image goes through thresholding process for the purpose of segmenting the ROI of the image. A Global thresholding value can be applied to remove the unwanted part of the image and segment the part with higher pixel density. Histogram can be used to check for pixel distribution. Thus, using value from all these fields the best ROI of the image is acquired [5]. Flow of the System Feature Extraction As each image is captured bydifferent angles of the patient, the different features of these images may vary among themselves. Also, the past mammography or future mammography image of the patient could tell a lot about the tumour details. So, at each projected angle, a matrix, A i , with images and with 15 texture and statistical features, i is the number of projections. Matrix of the database with features Edge Detection The Region of Interest of the image is extracted from the mammography image. The different edge detection techniques Sobel, Canny, Prewitt, Roberts and fuzzy logic methods is applied to detect the edges of tumour cells. Texture Features In imaging terms, texture can be described as the spatial arrangement and there is a variation of intensities gray values within the image. Texture features have been very useful for identifying micro-calcification. The image acquisition can be used to create two different regions. The first region is the central area of the breast where the thickness is nearly uniform, and is referred to as the constant thickness region. The other consists of tissue near the edge of the breast where the thickness gradually tapers due to the breast geometry. These features have different elements which have different values. Neural Network Neural Network NN is one of the best machine learning techniques for classification, regression and pattern recognition. NN have discovered numerous applications in capacity guess and signal processing. A lot of research work on detection of cancerous cells shows that the number of false positive cases have decreased drastically. However, there are several limitations to the machine learning techniques. Second it takes long time to train the system through complex architecture and parameters updates in each iteration. Third, it can be caught to neighbour minima so that the optimal performance cannot be guaranteed. Most popular Neural Network NN algorithms used in classification is feed forward with back propagation algorithm. The input layer, output layer and one or more hidden layers as shown in the figure below. Every node is interconnected by weights and data engenders starts from one layer to another through a sigmoidal activation function. The Neural Network is a supervised learning process as the data are feed to the ANN, the weights are adjusted

through backpropagation procedure to meet the desired output. These patterns help us to understand the cancer behaviour better. It also help us predict and to identify cancer. The main objective of the paper is to generate highly accurate texture features by means of curving out ROI of the mammography image. These acquired ROI are further used for extracting the texture features.

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