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Study On Detection Of Lung Tumour.

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ABSTRACT

Cancer is a cluster of tissue that is preset by a sluggish accumulation of irregular cells. All tumors are not cancerous, tumor refers to abnormal mass of tissue that may be of solid or fluid and they do not return after removal of abnormal tissue which are not malignant. The word cancer is derived from the Latin word crab, because malignant tumor is very irregular in shape and like a crab which grab and not allow to go, as this malignant tumor invade surrounding tissues, metastasize (spread to other organs) unless untreated leads to death of patient. This malignant tumor increases the life span of RBC as bone marrow keep on producing RBC as a result number increases which erupt blood vessels. There are mainly two types of lung cancer: Non-Small Cell Lung Cancer (85% of lung cancer effected patients). Small Cell Lung Cancer (10 to 15% of lung cancer effected patients), this type of cancer has more growth rate than (NSCLC). Lung carcinoid tumor (5%). Lung cancer is more predominant in men than women. Early stage detection malignant tumor can provide more treatment options, less invasive surgery and increases the survival rate. In Image processing procedure the process such as image pre-processing, segmentation and feature extraction has been discussed in detail. Aiming to get the more accurate results by using various enhancements and segmentation techniques. It will minimize the detection error made by the physicians' naked eye and time constraint.

Keywords: Magnetic Resonance Imaging (MRI), Computed Tomography (CT), Pre-processing techniques, image segmentation, feature extraction, classification techniques.

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INTRODUCTION

Digital image processing is the best tool to detect lung cancer in earlier stages. There are various scans images as input, they are ct images, pet images, MRI image. For PET (positron emission tomography) images radioactive trackers are to be injected in to blood along with glucose, Computed Tomography (CT) images are obtained by imposing patient with low dose of x-rays in 3-dimensions which has the radiation effect same as experiencing radiation when travelling in a long distance flights. PET and CT has the same radiation effect, MRI does not have the radiation effect but before MRI patient should have MRI safe aneurysm clips. Generally there are there types of noises in CT images position noise, impulse noise and speckle noise end to remove these noises there are various filters available to remove noise, and from further stages like segmentation , feature extraction and classification can give the result regarding tumor is present or not in lungs. Same process is repeated periodically, if growth of tumor is abnormal determined by periodic feature extraction values results cancer in lungs.

Detection of Lung tumour, which is a comfortable task, instead it is interrogation to find machine. The medical MRI or CT image detection is convoluted image pre-processing, segmentation, feature extraction and object detection. It be made of a database which is predefined shapes that assistant with an object to categorize. It is very important task in numerous arenas for instance Navigation, biomedical images and remote sensing. In Medical image detection and identification various methods are used: Hopfield Neural Network (HNN), Gray Level Co-occurrence Matrices Feature (GLCM), Fuzzy C-Means (FCM), Artificial Neural Network (ANN) and Support Vector Machine (SVM).

RELATED WORK

Srilatha, K., Kaviyarasu, S et al [11] and Fatma Taher Rachid Sammouda et al [1] presented two segmentation processes have been used, they are Hopfield Neural Network (HNN), and Fuzzy C-Mean (FCM) Clustering algorithm. Results shown that the HNN segmentation results are more accurate and reliable than FCM clustering in all cases. The Hopfield Neural Network succeeded in extracting the nuclei and cytoplasm regions, but FCM failed in detecting the nuclei, instead it detected only part of it. Along with that, the FCM is not delicate to intensity dissimilarities as the segmentation inaccuracy at convergence is greater with FCM related to that with Hopfield Neural Network (HNN). The Hopfield Neural Network (HNN) will be used as a basis for a Computer Aided Diagnosis (CAD) system for early detection of lung cancer.

Moffy Vas, Amita Dessai et al [2] deals with the methodology adopted in this project aims to develop an automated system for lung cancer detection. Applied of median Filter to eliminate impulse noise in the images. Artificial neural networks is used as a classifier. This methodology adopted in this project resulted in an accuracy of 92% for the hospital database.

Yosefina Finsensia Riti, Budi Windarta, Lina Choridah et al [3] In this study it was demonstrated that the morphological classification of margin CT scan image result by using the Otsu thresholding segmentation method, with several features extraction such as convexity, solidity, circularity, and compactness, and classification with MLP, from 54 image data, and concluded that the feature classification with MLP capable to distinguish the characteristics of the regular and irregular lesion margin with an accuracy value of 85%, sensitivity 85% and specificity of 85%.

Meryl B Asha C, Nandhini J, and K Srilatha et al [7] and Lingling Li, Yuan Wu, Yi Yang , Lian Li, Bin Wu, et al [5] it was demonstrated that lung cancer could be detected in the early stages from CT images by using image processing technologies and artificial intelligent algorithms. In this proposed system, firstly, the CT images were preprocessed to remove noise by using the median filter and the Wiener filter. Secondly, the preprocessed images were then converted to binary images through Otsu thresholding method. Thirdly, body regions were extracted from the binary images and features (contrast, correlation, energy and homogeneity) were calculated by using Gray Level Co-occurrence Matrices Feature (GLCM) on body regions. Finally, BPNN and SVM, together with features, were used to establish lung cancer detection models, and showed the accuracies of BPNN model and SVM model were 83.07% and 96.32% respectively for lung cancer identification on the prediction set (451 images).

Lilik Anifah, Haryanto, Rina Harimurti, Zaimah Permatasari et al [6] and Bathala Sivakumar, and Srilatha K et al [4] presented the preprocessing stage (median filter and Histogram equalization), image segmentation, feature extraction (GLCM), and classification (back propagation ANN). The weight generated from the learning process is used to test 50 CT- image data. And the results show that the system works with accuracy 80%.

Melissa, S., Srilatha, K et al [9] and S. Kalaivani, Pramit Chatterjee, Shikhar Juyal, Rishi Gupta et al [8] deals with the design of the system was observed to be ideal for performing as a Computer Aided Design (CAD) system for detection of lung cancer and helpful in assisting radiologists in the detection process by validating their diagnosis to prevent incorrect diagnosis. In Histogram equalization and Binarization is used as preprocessing techniques, Thre sholding is used as segmentation, region props function in MatLab is used for feature extraction and Back propagation Network is used for classification.

Rachid Sammouda et al [10] presented Erosion, Median filter, Dilation Outlining, Lung Border Extraction and Flood Fill algorithm, in sequence. After the extraction step, the extracted lung regions are segmented using an unsupervised modified Hopfield Neural Network Classifier. The segmented lung regions are grouped into very similar clusters giving more understanding to the different tissues in the lung regions. Then, the initial lung candidate nodules resulting from the segmentation process are used in the nodules detection process. Finally, there are three main filters to extract the true lung cancer regions with respect to the information formulated from experimented radiologists in the field. Objective is to detect tumor in lungs, increase effective feature extraction parameters, and design a suitable classifier and also to get higher accuracy.

CONCLUSION

It is considered and analyzed for various detection techniques and image processing procedures which could be employed in fully automated lung tumour of cancer detection. Modern day's a number of existing methods have been used for the prediction of tumour of lung cancer at primary stage. In this review paper a precipitous of different method for identification and detection of digital image processing working in the region of lung cancer detection. The key focus is on by using quite a lot of detection procedure combined with many segmentation ways for recognition of lung tumour using digital image processing. The summary of various detection and segmentation measures by their detection accuracy, selectivity, and sensitivity, efficiency of finding of lung tumour has attainable. For the time being the study it has distinguished improved result.

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