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LUNG CANCER CLASSIFICATION USING KNN CLASSIFIER

[1] Bana Vishnu Vardhan Reddy, [2] R. Puviarasi

Abstract-- *Lung cancer is a cancer of the lungs that starts. Two spongy organs in your chest are your lungs, which you ingest inhaling oxygen and releasing carbon dioxide as you exhaust. In the early stages of lung cancer, it does not usually cause signs or symptoms. Lung cancer symptoms and signs typically arise as the disease progresses. The early diagnosis is required for lung cancer classification. In this study, the automatic classification of lung cancer classification system is discussed. Initially, the input images are given to energy featurefor feature extraction and K-Nearest Neighbor (KNN) classifier is used for classification. The performance of proposed system produces the classification accuracy of 91%using KNN classifier.*

Keywords-- *Lung cancer classification, Energy feature extraction, KNN classifier*.

I INTRODUCTION

Automatic identification of lung defects due to planocellular cancer of the lung [1].Considering that lung cancer is one of the lest cancers and that it is typically detected too late, the remedy is to try to detect it early, using the cheapest screening devices, chest x-rays. Texture analysis Lung cancer extraction and classification based on feature extraction [2].To order to curate illness entirely, early cancer identification is beneficial. Several methods for detecting lung cancer are available in literature.

A malignant lung tumor that is characterized by uncontrolled cell growth in lung tissues is Lung Cancer, also known as lung cancer. Computed Tomography (CT) system for the detection of lung cancer [3]. Visual interpretation of the database can lead to later cancer detection and thus to late cancer treatment that only increases the risk of cancer death.Lung cancer diagnosis and estimation of multi-stage lung cancer using an SVM classification. The risk of lung cancer can also be estimated [4]. Improvement of the picture and segmentation were performed separately at every point of the classification.

Cancer detection with a guided machine learning algorithm small-cell lung cancer [5]. Statistically, late stage diagnosis caused most lung cancer-related deaths. Early detection of lung cancer may be the only way to save lives like other forms of cancer. Deep neural networks lung cancer identification [6]. Our deep neural network adds new features through comprehensive study through introducing additional coating and maximum pooling layers

Lung image classification is presented in this study. The rest of the paper is organized as follows: The methods and materials used for lung image classification is discussed in section 2. The experimental results and discussion are explained in section 3. The last section concludes the lung image classification.

[1]*Saveetha School of Engineering, Saveetha Institute of Medical and Technical Sciences, Chennai, India*

[2]*Saveetha School of Engineering, Saveetha Institute of Medical and Technical Sciences, Chennai, India Email: puviarasi88@gmail.com*

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II METHODS AND MATERIALS

Initially, the input lung images are given for feature extraction using energy feature. Finally, KNN classifier is used for prediction.

Energy feature extraction:

The first-level approximate coefficient produces much more energy than the rest of the decomposition tree coefficients at the same point. Due to their high frequency elements, the energy of the information coefficients is more distinctive to use. The energy is the sum of accurate transformation coefficients by the wavelet.The energy of the wavelet coefficient depends on the input signal in different scales [7-8]. The signal energy is mostly found in the approximation and some information.

KNN Prediction:

KNN is one of the simplest algorithms for regression and classification problems used in machine learning.KNN is an algorithm for slow, non-parametric computing. The goal is to use a data base in order to predict the classification of a new samplespoint by separating the data points in several classes.KNN algorithms are using data and classifying new data points on a similarity basis.The task of KNN is to locate the distances between query and all of the data examples. The specified number examples (K) is selected nearest to the query.

III RESULTS AND DISCUSSION

The images are given to energy features for feature extraction and KNN classifier is used for prediction. The sample lung images are shown in figure 1.

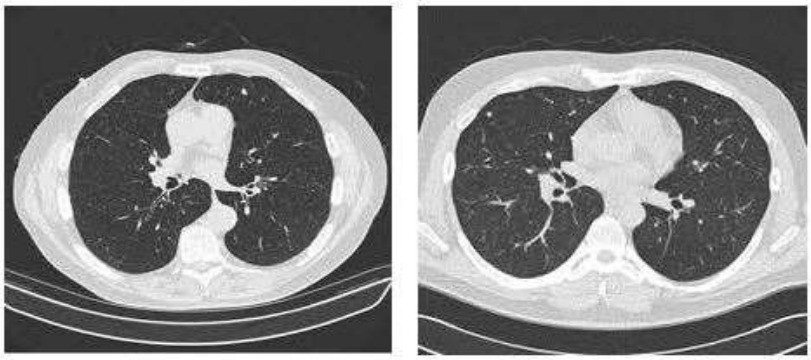

Figure 1: Sample lung images

The classification accuracy, sensitivity and specificity are shown in Table1.

Table 1: Classification accuracy, sensitivity and specificity of proposed system

Energy feature	Performance of lung cancer classification		
	Accuracy (%)	Sensitivity (%)	Specificity (%)
1	87	85	86

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2	91	90	92
3	93	92	94

From the above table, it is observed that the overall classification accuracy is 93%and its sensitivity and specificity are 92% and 94% made by using energy based KNN classifier.

IV CONCLUSION

An automatic classification of lung cancer classification using KNN is described in this study. Initially the images extracted by usingenergyfeatures. The KNN classifier is used for final output prediction. The overall classification accuracy is 93% by using energy and KNN classifier. It's sensitivity and specificity are 92 % and 94 % by using energy based KNN classifier.

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