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CT LUNG IMAGES CLASSIFICATION FOR NODULE DETECTION

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Abstract:

Lung cancer is an early lung cancer. The world's greatest cause of death is lung cancer. Lung cancer typically does not cause signs or symptoms in its early stages. In order to reduce the mortality rate early detection of lung cancer is required. Computed Tomography (CT) lung images classification for nodule detection is discussed in this study. At first energy features are used for feature extraction. Then maximum likelihood classifier is used for classification. The experimental results show the performance of pulmonary nodules classification in terms of accuracy.

Keywords:Pulmonary Nodules, CT lung image, Maximum likihood, Classification

Introduction:

The risk of lung cancer can also be estimated [1]. Improvement of the picture and segmentation were performed separately at every point of the classification.CT system for the detection of lung cancer [2]. 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.

Texture analysis Lung cancer extraction and classification based on feature extraction [3].To order to curate illness entirely, early cancer identification is beneficial. Several methods for detecting lung cancer are available in literature.Automatic identification of lung defects due to planocellular cancer of the lung [4].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.

Deep neural networks lung cancer identification [5]. Our deep neural network adds new features through comprehensive study through introducing additional coating and maximum pooling layers.Cancer detection with a guided machine learning algorithm small-cell lung cancer [6]. 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.

An efficient method for parallel algorithms for pulmonary nodule classification with the help of Bayes theorem is discussed. Section 2 explains the methods and materials for the classification of the pulmonary picture. The section 3 describes about Results and discussions of the experiments. The final segment ends the classification of lung cancer.

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Methods and Materials:

The input photographs are initially given to energy feature for feature extraction. The maximum likelihood classifieris used for prediction.

Energy based feature extraction

Energy in image processing is a quantitative concept. The goal behind the 'power' concept is to mitigate or optimize a problem, depending on your goal. It is used as an energy minimization issue for the standard object detection or segmenting mission.These are watts per meter of square or joules per second per meter of square. But the sensor has a region and for a short time it absorbs photons so that you are multiplying by the pixel region and the pixel integration time and you are jouling [7-8]. You must summarize all the gray levels to get the energy in an image.Energy is a relatively loose word for any function specified by the consumer. It defines an energy that captures the way we want and descends gradients to calculate their lowest value, thus providing a solution for segmentation of images.

Maximum likelihood classification

The maximum probability rating is one of the most common remote sensing classification methods in which a pixel with the highest probability is listed in the respective class. The probability of a Pixel belonging to class k is known as an afterlife probability.Maximum Likelihood is an approach frequently used to estimate the parameters of an observed model. Set the models parameters to values that maximize the likelihood of the given data parameters [9]. Maximum likelihood evaluation is a process that sets the values for the model parameters. It is found that the parameter values maximize the probability of the process described by the model producing the actual data. Figure 1 shows the ML classification.

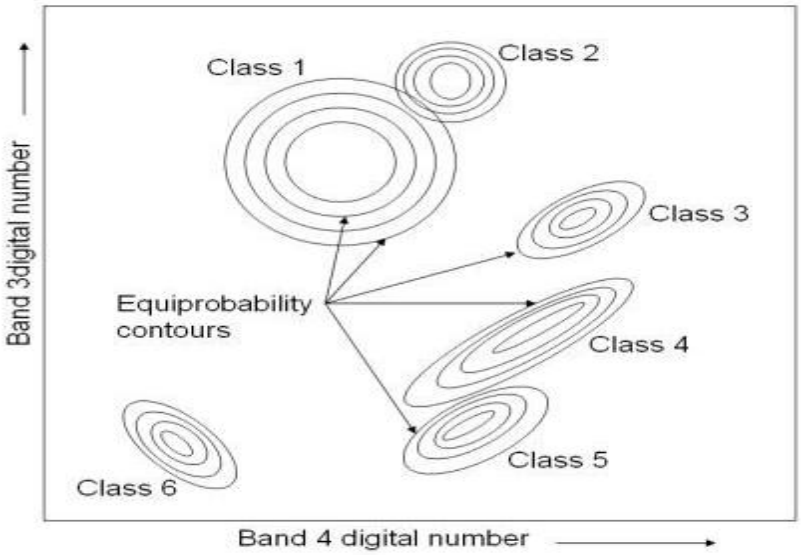

Figure 1 ML classification

The highest probability, also referred to as maximum probability process, is to find the value of one or more parameters for a certain statistical data, which maximises the distribution of the known probability. For a parameter, the maximum probability estimate is indicated. The maximum probability theory is a method for obtaining the optimal parameter values that characterise a model. And it increases the model's probability to hit the "true" model in that process.

The third form used to construct trees is the highest probability. Likelihood gives probabilities of a certain tree's sequence as a model of its evolution. The more likely the tree sequences are the better the tree.

Results and Discussion

The achievement of the proposed system is made by CT lung images shown in figure 2. The performance is measured in terms of accuracy.

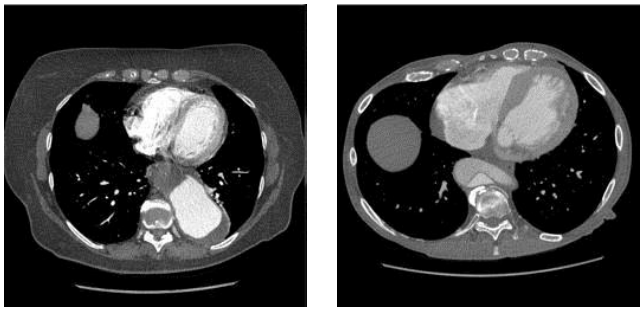

Figure 2 Sample lung images

The input lung images are given to energy feature extraction. Finally, maximum likelihood classifier is used for classification. Table 1 shows the performance of proposed system.

Table 1 Performance of Bayes theorem

Energy level	Performance of Bayes theorem in (%)		
	Accuracy	Sensitivity	Specificity
1	89	88	93
2	93	87	92
3	95	89	91

From table 1, it is observed that the data parallel algorithm performs the higher classification accuracy of 95% and its sensitivity and specificity are 89% and 91%.

Conclusion:

CT lung images classification for nodule detection is presented. The performance is evaluated by CT lung images. The pulmonary input CT is supplied to feature extraction by using energy feature extraction. Then the maximum likelihood classifier is used for prediction. The classification accuracy is 95% obtained by using energy and maximum likelihood classifier.

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