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Lung Cancer Segmentation and Predicting Using CNN Algorithm

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ABSTRACT: Image processing techniques are widely used in several medical areas for image improvement in earlier detection and treatment stages, where the accuracy factor is very important to discover the abnormality issues in target images, especially in various cancer tumors such as lung cancer etc. In the field of medical diagnosis an extensive diversity of imaging techniques is presently available, such as radiography, computed tomography (CT) and magnetic resonance imaging (MRI). Medical image segmentation is an essential step for most consequent image analysis tasks. Although the original CNN algorithm yields good results for segmenting noise free images, it fails to segment images corrupted by noise, outliers and other imaging artifact. And Image quality and accuracy is the core factors of this project, image quality assessment as well as improvement are depending on the enhancement stage where low preprocessing techniques is used based on CNN and feature extraction. Following the segmentation principles, an enhanced region of the object of interest that is used as a basic foundation of feature extraction is obtained.

KEYWORDS: Convolutional Neural Network(CNN),Deep Learnig, Neural Network

I. INTRODUCTION

Lung cancer is one of the commonest cancers in the industrialized world, and persons with this grave disease must deal not only with the physical effects but also with the psychosocial aspects. Lung cancer is a disease of abnormal cells multiplying and growing into a tumor. The overall 5-year survival rate for lung cancer patients increases from 14 to 49% if the disease is detected in time. Among different types of cancer the lung cancer is the most aggressive and best practice to its accurate prognosis is the determination of the current stage of the disease. Three main factors in cancer staging are primary tumor, regional lymph nodes and metastasis. One of the most important and difficult tasks a doctor has to carry out is the detection and diagnosis of cancerous lung nodules from x-ray image's result. Given that lung cancer is one of the common cancers world-wide, the implications of focusing on quality of life as well as survival require to be understood. Early detection is the most important for reducing the death due to lung cancer. The early detection of the lung cancer is a challenging problem, due to both the structure of the cancer cells and the stained methods which are used in the preparation of the sputum cells. Now there are three main methods to use for diagnosis of lung cancer: biochemical diagnosis (serology and immunology), imaging diagnosis, and cytology histology diagnosis

II. LITERATURE SURVEY

In the LSM, the movement of the zero level set is actually driven by the level set equation (LSE), which is a partial differential equation (PDE). For solving the LSE, most classical methods such as the upwind scheme are based on some finite difference, finite volume or finite element approximations and an explicit computation of the curvature. Unfortunately, these methods cost a lot of CPU time. Recently, the lattice Boltzmann method (LBM) has been used as an alternative approach for solving LSE. It can better handle the problem of time consuming because the curvature is implicitly computed and the algorithm is simple and highly parallelizable. The LBM is used to solve the LSE. The proposed method is based on the approach of the LBM PDE solver defined. In the proposed method, using a modified CNN objective function, we design a new fuzzy external force (FEF). The method is fast, robust against noise, and efficient whatever the position or the shape of the initial contour and can detect efficiently objects with or without edges. It has, first, the advantage of the CNN which gives it the latitude to stop the evolving curve according to the membership degree of the current pixel, second, the advantages of the LSM which allow it to handle complex shapes,

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topological changes, and different constraints on the contour smoothness, speed, size, and shape which are easily specified, and, third, the advantages of the LBM which make it very suitable for parallel programming due to its local and explicit nature.

III. SYSTEM REQUIREMENTS

EXISTING SYSTEM DETAILS

In existing system, medical image segmentation algorithm was put forth by Automated segmentation of images has been considered an important intermediate processing task to extract semantic meaning from pixels. In general, the fuzzy c-means approach (CNN) is highly effective for image segmentation. But for the conventional CNN image segmentation algorithm, cluster assignment is based exclusively on the distribution of pixel attributes in the feature space, and the spatial distribution of pixels in an image is not taken into consideration. The existing CNN image segmentation scheme by utilizing local contextual information and the high inter-pixel correlation inherent. Firstly, a local spatial similarity measure model is established, and the initialclustering center and initial membership are determined adaptively based on local spatial similarity measure model. Secondly, the fuzzy membership function is modified according to the high inter-pixel correlation inherent. Finally, the image is segmented by using the modified CNN algorithm. And possibility can be viewed as absolute typicality, it measures the degree to which a point belongs to one cluster relative to all other data points,

PROPOSED SYSTEM DETAILS

In the field of medical diagnosis an extensive diversity of imaging techniques is presently available, such as radiography, computed tomography (CT) and magnetic resonance imaging (MRI). Medical image segmentation is an essential step for most consequent image analysis tasks. Although the original CNN algorithm yields good results for segmenting noise free images, it fails to segment images corrupted by noise, outliers and other imaging artifact. And Image quality and accuracy is the core factors of this project, image quality assessment as well as improvement are depending on the enhancement stage where low preprocessing techniques is used based on CNN and feature extraction

IV. MODULES DESCRIPTION

Upload Datasets:

Lung cancer is one of the most common and deadly diseases in the world. Detection of lung cancer in its early stage is the key of its cure. In general, measures for early stage lung cancer diagnosis mainly includes those utilizing X-ray chest films, CT, MRI, isotope, bronchoscopy, *etc.*, among which a very important measure is the so-called pathological diagnosis that analyzes the specimens of needle biopsies obtained from the bodies of the subjects to be diagnosed. The lung images are uploaded to diagnosis the lung cancer.

Preprocessing:

The goal of the Median filter is to filter out noise that has corrupted image. It is based on a statistical approach. Typical filters are designed for a desired frequency response. Median filtering is a nonlinear operation often used in image processing to reduce "salt and pepper" noise. A median filter is more effective than convolution when the goal is to simultaneously reduce noise and preserve edges.

Image Segmentation:

Image segmentation is an important process for the most part of image analysis consequent assignments. In particular, many of the previous methods for image report and identification depend especially on the segmentation outcomes. Segmentation separates the picture into its ingredient sections or things.

Feature Extraction:

Image features Extraction stage is an important stage that uses algorithms and techniques to detect and isolate various desired portions or shapes (features) of a given image. To predict the probability of lung cancer presence, In fact, the proposed approach does the exact opposite; it tries to create a large number of weak features and expects the classifier to weight them according to their relevance during training. In general, many of the features may turn out to be irrelevant for a given application. However, our approach begins with a conservative feature set in order for it to be application-independent, at the expense of increased training complexity. In feature extraction, we calculate the size and shape of the tumor identified by calculating the diameter value of that tumor and provides result in millimeter (mm)

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Evaluation criteria:

The proposed technique is efficient for segmentation principles to be a region of interest foundation for feature extraction obtaining. The proposed technique gives very promising results comparing with other used techniques. Relying on general features, a normality comparison is made. The main detected features for accurate images comparison are pixels percentage and mask-labeling with high accuracy and robust operation

V. CONCLUSIONS

This project addresses few image processing methods for a CAD system for lung cancer. However these algorithms are applied with assumptions such as asymmetric property of CXR and nodules represents are only lung cancer nodules. As for further development segmentation process can be improved along with the lung nodule extraction methods where artificial intelligent methods can be used which ultimately increase the accuracy of the tested results. This project also needed to be continuing on lung nodule detection from blob area values which needed to be incorporated with further testing.

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