Lung Cancer Detection Using Threshold Differencing and Contrast Enhancement

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Abstract- Lung cancer extract application is very useful in case of diagnose, monitoring and quantifying correct diagnose. However, automated detection of cancer in Lung poses many challenges with regard to characteristics of an image. Many techniques are involved to detect the cancer in the medical images such as watershed, image Detection. Image Detection method is undertaken here for evaluating their relative performance in the Detection of cancer. In the current work we are performing the contrast Enhancement and Threshold differencing. The present application is intended to assist the radiologist in performing an in-depth examination and considerably reduced time.

Keywords – Contrast Enhancement, Threshold frequency, detection

I. INTRODUCTION

Medical imaging is the technique and process which is used to create images of the human body for clinical purposes or for medical sciences.The dawn of the modern era of medical diagnosis can be traced to 1896, when the first x-ray has been captured by Wilhelm Roentgen, which was of his wife's hand. The development of radiology grew rapidly after that. Later, modern x-ray techniques have been developed to significantly improve both the contrast detail and the spatial resolution. Better image details let the smaller places diagnosis of pathology than may be discovered by older technologies. Radioscopy is a flow of medical science that treats with medical modalities. X-ray devices or other such radiation machines are utilized for imaging purpose. Radiology also includes that do not require radiation, such as ultrasound and MRI. Radiology can be divided into two streams which are diagnostic radiology and therapeutic radiology. Diagnostic radiology is interested with using different imaging modalities to serve in disease diagnosis. Diagnostic radiology can be further divided into multiple sub-specialty domains. Interventional radiology is one of the sub-specialty areas which use the imaging modalities of diagnostic radiology to guide minimally invasive surgical procedures. On the other hand, Therapeutic radiology uses radiation to treat diseases like cancer.

Some of the popular imaging modalities are:

- General radiography
- Computed Tomography (CT)
- Sonography
- Magnetic Resonance Imaging(MRI)
- Nuclear imaging techniques
- Ultrasound

General radiography:

In this imaging modality, x-rays are used to create images and for the evaluation of several soft tissue and bony structures. Angiography and fluoroscopy are some of the spatial applications of X-ray imaging which have real-time imaging ability.

1.CT scanning:

This imaging technique utilizes X-rays in conjunction with computing algorithms to image tissues in the body. At times, contrast media is utilized to delineate anatomy and allow 3D reconstructions of structures, such as veins and arteries.

2.Sonography:

Medical ultra sonography uses high frequency sound waves to visualize soft tissue structures in the body in real time and does not involve any radiation.

3.Magnetic Resonance Imaging (MRI):

It is a noninvasive medical test that utilizes a powerful magnetic field, radio frequency pulses and a computer to produce detailed images of organs, soft tissues, bone and virtually all other internal body structures for treatment and diagnosis.

4.Nuclear medicine:

This imaging technique involves the use of radionuclides or radiopharmaceuticals for evaluation of lungs, heart, liver, thyroid, bones and gallbladder for diagnosis and treatment. Radiologists utilize these imaging technologies for diagnosis and treatment of various diseases.

5.Ultrasound:

Ultrasounds works on the principle that sound is reflected at different speeds by tissues or substances of different densities and has been used to image the human body. Ultrasound imaging is widely used and safe imaging system in medical field, due to its nature, low cost and real time imaging. The important use of ultrasound imaging includes imaging the abdominal organs, heart, breast, muscles, tendons, arteries and veins.

II. CONTRAST ENHANCEMENT

In spite of the significant advances made in the Medical imaging techniques over the past few decades, several practical factors often lead to the acquisition of images with less than the desired levels of contrast, visibility of detail,or overall quality.When the nature of the artifact that led to the poor quality of the image is known, such as noise then there is a need to design specific methods to remove or reduce the artifact and it may be possible to include additional steps or modifications in the imaging procedure to improve image quality. Following are a few biomedical imaging situations and applications where enhancement of the feature of interest would be desirable. These are:

- Micro calcifications in mammograms.
- Lung nodules in chest X-ray images.
- Vascular structure of the brain.
- Hair-line fractures in the ribs.

III. DETECTION PROCESS

In computer vision, Detection refers to the process of partitioning a digital image into multiple regions (sets of pixels). The goal of Detection is to simplify and/or change the representation of an image into something that is more meaningful and easier to analyze. Image Detection is typically used to locate objects and boundaries (lines, curves, etc.) in images. Partitioning of an image into several constituent components is called Detection. Detection is an important part of practically any automated image recognition system, because it is at this moment that one extracts the interesting objects, for further processing such as description or recognition. Detection of an image is in practice the classification of each image pixel to one of the image parts. Detection subdivides an image into its constituent regions or objects. The level to which the Detection is carried depends on the problem being solved. That is, Detection should stop when the objects of interest in an application have been isolated. For example in the automated inspection of electronic assemblies the interest lies in analyzing images of products with objective of determining the presence or absence of specific anomalies, such as missing components or broken connection paths. Many techniques are involved to detect the lesion in the medical images such watershed, image Detection, Image Detection method is undertaken here for evaluating their relative performance in the Detection of Lesion. The high need of the method that could separate the cancer area automatically and detect the correct lesion over there

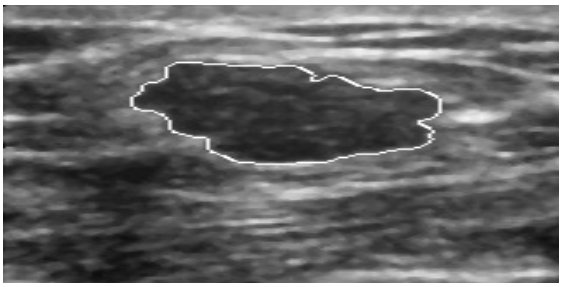

Figure: Detection of Cancerous part

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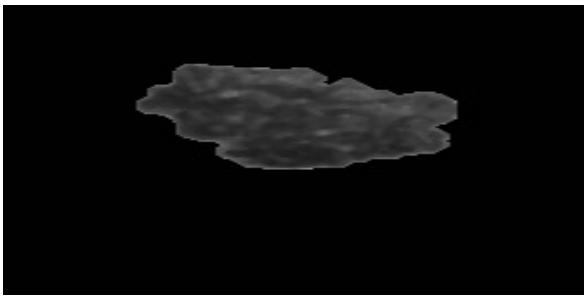
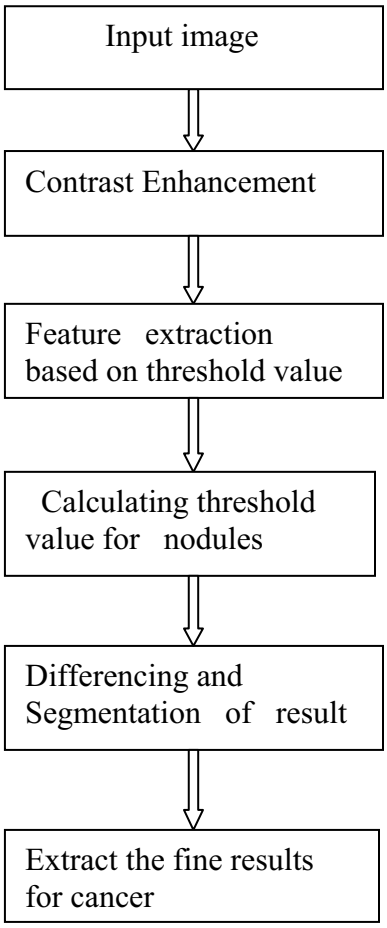


Figure: Cancerous part detected



IV. PROPOSED THEORY

In the proposed theory, we are presenting the novel technique to detect the Lung cancer from the CR or DR modality. We are using the Threshold differencing Technique and contrast Enhancement to find the affected area. The idea behind this technique is to find the cancer.

We set the normal threshold nodule value in preset database. These values indicate that image nearby these range on subtraction may considered for the normal value. Fig (1) and fig (2) indicates that after changing the contrast value from the obtained image we need to difference the threshold value from the preset database and mark the boundary where more changes are obtained when whole scan for this process is completed, detect the area and segment it. Obtain part may be affected with cancer

V.CONCLUSION AND FUTURE WORK

From the above theory it is clear that present method may work as an automatic lung cancer extraction, which can help the radiologist in performing an in-depth examination. In future we will implement this technique to compare the results clinically and accuracy will be checked thoroughly.

REFERENCES

[1] Yao-lin Li, Jun Feng, Yan Ren , Qiu-ping Wang , Bao-ying Chen, "Breast Cancer Detection based on Mixture Membership Function with MFSVM-FKNN Ensemble Classifier", 9th International Conference on Fuzzy Systems and Knowledge Discovery (FSKD 2012) , 2012

[2] Viet Dzung Nguyen, Duc Thuan Nguyen, Huu Long Nguyen, Duc Huyen Bui, Tien Dzung Nguyen , "Automatic identification of massive lesions in digitalized mammograms" , Department of Electronic Technology and Biomedical Engineering , Hanoi, Vietnam , 2012 IEEE

[3] Kai Hu, Xieping Gao, and Fei Li, "Detection of Suspicious Lesions by Adaptive Thresholding Based on Multiresolution Analysis in Mammograms" IEEE Transactions on instrumentation and measurement , VOL. 60, NO. 2, February 2011

[4] Muhammad Asad, Naeem Zafar Azeemi, Muhammad Faisal Zafar, and Naqvi S.A, "Early Stage Breast cancer Detection through Mammographic Feature Analysis", 2011 IEEE

[5] A.Mencattini, M. Salmeri, P. Casti, "Bilateral asymmetry identification for the early detection of breast cancer" , Dept. of Electronic Engineering, University of Rome Tor Vergata, Rome, Italy, 2011 IEEE

[6] Imene Cheikhrouhou, Khalifa Djemal and Hichem Maaref, "Protuberance selection descriptor for breast cancer diagnosis" , IBISC Laboratory, Evry Val d'Essonne University, 2011 IEEE

[7] Subarna Chatterjee, Ajoy Kumar Ray, Rezaul Karim , Arindam Biswas , "Detection of micro- calcification to Characterize Malignant Breast Lesion" Third National Conference on Computer Vision, Pattern Recognition, Image Processing and Graphing.