DETECTION OF LUNG CANCER USING IMAGE PROCESSING

Ms.Deepushree.V s[1], Mr Dhanush M V s[2]
BGS Institute of Technology
Department of Computer Science
Mandya, Karnataka

ABSTRACT:Lung cancer main disease cause of death of among throughout the world. Lung cancer is causing very high mortality rate. There are various cancer tumors such as lung cancer, breast Cancer, etc. Early stage detection of lung cancer is important for successful treatment. Diagnosis is based on Computed Tomography (CT) images. In this Histogram Equalization used to preprocessing of the images and feature extraction process and classifier to check the condition of a patient in its early stage whether it is normal or abnormal.

I. INTRODUCTION:

The field of Medical Image Processing (MIP) and the applications in Computer Assisted Diagnoses (CAD) and therapy (*e.g.*,Computer Assisted Surgery – CAS) which strongly de-pend on MIP methods are of increasing importance in modern medicine. Nevertheless, due to its proximity to medical imaging devices, the field is widely considered as an engineering discipline with a methodological progress that I

Somehow independent from medical problems and the clinical practice. Even if this might be correct for basic research on domain independent image processing methodology, it is surely wrong if one emphasizes on system research and development meant for support of diagnostics and therapy.

II. RELATED WORK:

Definitions, Material and Methods

Review Stage:

Some essential notions have to be defined for usage in the context of this paper.A challengeis exact descriptions of a work objective for which no real ideas and methods are present how to find a solution,whereas a task is an exact description of a work objective for which paths to build solutions already exist. Both kinds of descriptions shall be called problem.A medical problem shall be called a Most Relevant Medical Problem (MRMP), if its solution would have a high impact on the overall health status of people and/or on the efficiency of producing/sustaining health at a certain quality level. In the context of imaging, the important notion of Medical Image Interpretation (MII) is introduced as denoting the process of deriving medically relevant information from analyzing a medical image or a set of images. MII can be performed either by the physician (visual as-sessment) or by a MIP application (computer assessment), or in a combination of both (usually as computer supported assessment by the physician) As material for the process planning, all kinds of actual statistics and literature have been used. The Unified Modeling Language (UML) has served as method for working out the concepts and depicting the different aspects of the assessment task.

Data Forms: Medical image computing typically operates on uniformly sampled data with regular x-y-z spatial spacing (images in 2D and volumes in 3D, generically referred to as images). At each sample point, data is commonly represented in integral form such as signed and unsigned short (16-bit), although forms from unsigned char (8-bit) to 32-bit float are not uncommon. The particular meaning of the data at the sample point depends on modality: for example a CT acquisition collects radio density values, while a MRI acquisition may collect T1 or T2-weighted images. Longitudinal, acquisitions may or may not acquire images with regular time steps. Fan-like images due to modalities such as curved-array ultra-sound are also common and require different representational and algorithmic techniques to process. Other data forms include sheared images due to gantry tilt during acquisition; and unstructured meshes, such as hexahedral and tetrahedral forms, which are used in advanced biomechanical analysis (*e.g.,* tissue deformation, vascular transport, bone implants).

Segmentation: Segmentation is the process of partitioning an image into different segments. In medical imaging, these segments often correspond to different tissue classes, organs, pathologies, or other biologically relevant structures. Medical image segmentation is made difficult by low contrast, noise, and other imaging ambiguities. Although there are many computer vision techniques for image segmentation, some have been adapted specifically for medical image computing. Below is a sampling of techniques within this field; the implementation relies on the expertise that clinicians can provide.

a. **Atlas-Based Segmentation**: For many applications, a clinical expert can manually label several images; segmenting unseen images is a matter of extrapolating from these manually labeled training images. Methods of this style are typically referred to as atlas-based segmentation methods. Parametric atlas methods typically combine these training images into a single atlas image, while nonparametric atlas methods typically use all of the training images separately. Atlas-based methods usually require the use of image registration in order to align the atlas image or images to a new, unseen image.

b. **Shape-Based Segmentation**: Many methods parameterize a template shape for a given structure, often relying on control points along the boundary. The entire shape is then deformed to match a new image. Two of the most common shape-based techniques are Active Shape Models and Active Appearance Models. These methods have been very influential, and have given rise to similar models.

c.**Interactive Segmentation**: Interactive methods are useful when clinicians can provide some information, such as a seed region or rough outline of the region to segment. An algorithm can then iteratively refine such segmentation, with or without guidance from the clinician. Manual segmentation, using tools such as a paint brush to explicitly define the tissue class of each pixel, remains the gold standard for many imaging applications. Recently, principles from feedback control theory have been incorporated into segmentation, which give the user much greater flexibility and al-low for the automatic correction of errors.

Image Based Physiological Modelling:

Traditionally, medical image computing has seen to address the quantification and fusion of structural or functional information available at the point and time of image acquisition. In this regard, it can be seen as quantitative sensing of the underlying anatomical, physical or physiological processes. However, over the last few years, there has been a growing interest in the predictive assessment of disease or therapy course. Image-based modeling, be it of biomechanical or physiological nature, can therefore extend the possibilities of image computing from a descriptive to a predictive angle. Figure 1 represents the Digital Image based modeling of Left hand.

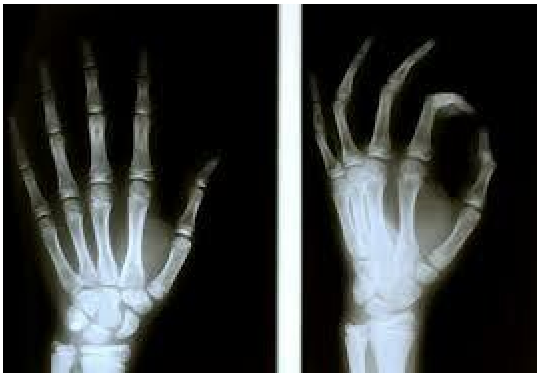

Fig1:1 represents the Digital Imagebased modelling.

According to the STEP research roadmap the Virtual Physiological Human (VPH) is a methodological and technological framework that, once established, will enable the investigation of the human body as a single complex system. Underlying the VPH concept, the International Union for Physiological Sciences (IUPS) has been sponsoring the IUPS Physiome Project for more than a decade; this is a worldwide public domain effort to provide a computational framework for understanding human physiology. It aims at developing integrative models at all levels of biological organization, from genes to the whole organisms via gene regulatory networks, protein pathways, integrative cell functions, and tissue and whole organ structure/function relations. Such an approach aims at transforming current practice in medicine and underpins a new era of computational medicine.

III. Proposed system:

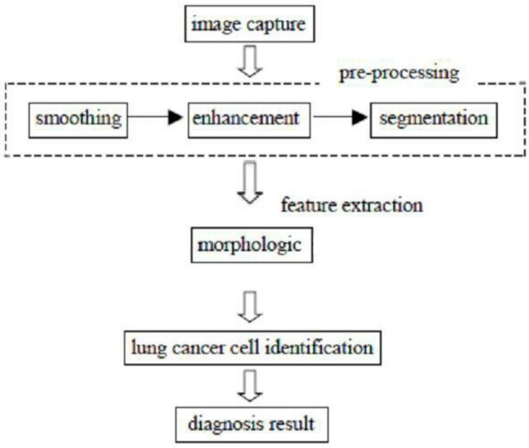

Fig2:block diagram for detection of lung cancer.

Image acquisition: through digital cameras are scanner or mobile phone image processing includes image enhancement, filtering of image to remove noise etc...

Image enhancement:There are two types of enhancement technique, Special domain and Frequency domain. Due to enhancement we improve the quality of images, for human viewer or to provide better input to image processing technique. We use histogram equalization technique for enhancement.

Image processing: Digital signal processing is the methodology to achieve fast and accurate result about the plant leaf diseases. It will reduce many agricultural aspects and improve productivity by detecting the appropriate diseases.

Image segmentation**:** Segmentation is nothing but the partation of image. segmentation is typicaly use to detect object and boundaries of an image. We use watershed segmentation tequnique. Watershed segmentation extract seeds indication the presence of object or background at ct scan image. The marker location are then set to be regional minima typically gradient of the original input image and the watershed algorithm is applied.

Feature extraction: It is important stage in image processing tequnique.it detect desired portion or shape of an image. features of the image should be extracted. This extraction could be any of stastical, structural or signal processing. There are various methods for feature extraction such as we need the features as like area,perimeter,roundness,eccentricity.

IV. RESULT AND DISCUSSION:

To Insert Image in Matlab:- We select the images from database. In the form of JPEG/PNG format.

Fig 2.Select the Images

To convert color image into gray image:- Convert the color image into gray scale image.

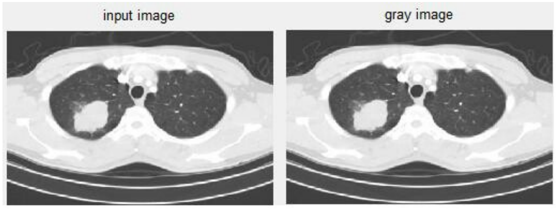

Fig 3.grey scale conversion.

To Enhance Image:-We use histogram equalization technique for enhancement

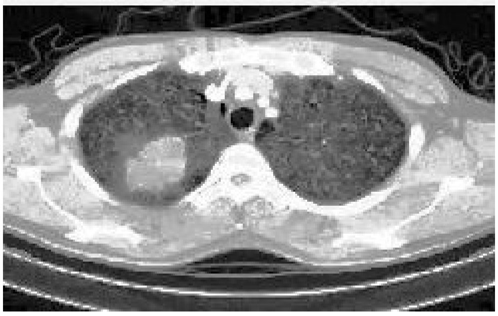

Fig.4: Enhanced image

V. CONCLUSION:

The most dangeorus and widespread disease in world is lung cancer acording to stage discovery of cancer cell,this shows the detection of cancer in early stage is plays important roll to avoid serious stages.to improve more accurete result three stage use Image enhancement, segmentation,feature extraction stage.the watershed segmentation tequnique gives more accuracy (84.55%) than other approach

Reference:

[1] D. Kornack and P. Rakic, “Cell Proliferation without Neurogenesis in Adult Primate Neocortex,” Science, vol. 294, Dec. 2001, pp. 2127-2130, doi:10.1126/science.1065467.

[2] M. Young, The Technical Writer's Handbook. Mill Valley, CA: University Science, 1989.

[3] R. Nicole, "Title of paper with only first word capitalized," J. Name Stand. Abbrev., in press.

[4] Nguyen, H. T.,et al,"watersnakes: energy-driven watershed segmentation", ieee transactions on pattern analysis and machine intelligence, volume 25, number 3, pp.330-342, march 2003

[5] Suzuki K., "false-positive reduction in computer-aided diagnostic scheme for detecting nodules in chest radiographs",academic radiology, volume 13, number 10, pp.10-15, february 2005

[6] D. Lin and C. Yan, "lung nodules identification rules extraction with neural fuzzy network", ieee, neural information processing, vol. 4, (2002)

[7] B. Zhao, G. Gamsu,.Ginsberg, l.Jjiang and. H. Schwartz, "automatic detection of small lung nodules on ctutilizing

[8]Aniket Gaikwad1, Azharuddin Inamdar2, Vikas Behera3Lung cancer detection using digital Image processing On CT scan Images