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THE ENVIRONMENTAL IMPACT FACTOR OF LUNG CANCER DISEASE DETECTION (LCDD) USING IMAGE MINING AMONG NON- SMOKERS

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Abstract: Image mining is primarily used to the requirements of finding the various applications in diverse fields such as retail, financial, communication, marketing organizations and medicine, for Improve the detection of disease in the medical field image mining techniques is widely used today. This paper describes the process of lung cancer detection and curing possibilities among non smokers. It may recover possible to the early stage. In general lung cancer is the uncontrolled growth of abnormal cells that start off in one or both lungs. The cancer cells can break and damage the tissues and also organs near the tumours of the body. It spread from one place to another. Using image quality and accuracy is the main factor for earlier disease detection and treatment stages including non-smokers also. Advanced database systems include object-oriented, object-relational data-bases, and specific application-oriented databases, such as biological database, spatial databases, time-series databases, text databases, and multimedia databases [1].Image mining has two different approaches one is extracted and collected in pattern. It is necessary to combine the different image formats to a regular format. In Feature Extraction, classification, image mining provides the framework for further improvement in other type of cancers in medical field. We proposed to the associative classification methodology to detect particularly lungs affects and curing possibilities.

Key words: image mining, cancer, cell, tumours, smokers.....

I.INTRODUCTION

Detecting and classified of the cancer for different medical images uses the high accuracy because they deal with human life. Today's computer professional can handle this situation very well but in some case false negative cases must be detected or classified at a very low rate. So they suggest that the improvement of the detection for cancer, especially lungs LCDD is necessary. So the computer professional interest in this field and introduce the good software to assist the detection of the lung cancer. For non - smokers creating this approaches they refer different image mining techniques and medical images .The techniques produces those images is very important in order to know what to apply to a certain medical image in order to get better results.

What is lung cancer?

Lung cancer is a cancer that starts in the lungs. To understand lung cancer, it helps to know about the normal structure and function of the lungs.

The lungs

Your lungs are 2 sponge-like organs found in your chest. Your right lung is divided into 3sections, called *lobes*. Your left lung has 2 lobes. The left lung is smaller because the heart takes up more room on that side of the body.

When you breathe in, air enters through your mouth or nose and goes into your lungs through the *trachea* (windpipe). The trachea divides into tubes called the *bronchi*(singular, *bronchus*), which enter the lungs and divide into smaller bronchi. These divide to form smaller branches called *bronchioles*. At the end of the bronchioles are tiny air sacs known as *alveoli*. Many tiny blood vessels run through the alveoli. They absorb oxygen from the inhaled air into your bloodstream and pass carbon dioxide from the body into the alveoli. This is expelled from the body when you exhale. Taking in oxygen and getting rid of carbon dioxide are your lungs' main functions. A thin lining layer called the *pleura* surrounds the lungs. The pleura protect your lungs and helps them slide back and forth against the chest wall as they expand and contract during breathing. Below the lungs, a thin, dome-shaped muscle called the *diaphragm* separates the chest from the abdomen. When you breathe, the

diaphragm moves up and down, forcing air in and out of the lungs.

Start and spread of lung cancer

Lung cancers can start in the cells lining the bronchi and parts of the lung such as the bronchioles or alveoli. Lung cancers are thought to start as areas of pre-cancerous changes in the lung. The first changes in the genes (DNA) inside the lung cells may cause the cells to grow faster. These cells may look a bit abnormal if seen under a microscope, but at this point they donor form a mass or tumor. They cannot be seen on an x-ray and they do not cause symptoms.

Over time, the abnormal cells may acquire other gene changes, which cause them to progress to true cancer. As a cancer develops, the cancer cells may make chemicals that cause new blood vessels to form nearby. These blood vessels nourish the cancer cells, which can continue to grow and form a tumour large enough to be seen on imaging tests such as x-rays.

At some point, cells from the cancer may break away from the original tumour and spread (metastasize) to other parts of the body. Lung cancer is often a life-threatening disease because it tends to spread in this way even before it can be detected on an imaging test such as a chest x-ray.

Types of lung cancer

There are 2 main types of lung cancer:

- Small cell lung cancer (SCLC)
- Non-small cell lung cancer (NSCLC)

Small cell lung cancer

About 10% to 15% of all lung cancers are small cell lung cancer (SCLC)[2], named for the size of the cancer cells when seen under a microscope. Other names for SCLC are *oat cell cancer*, *oat cell carcinoma*, and *small cell undifferentiated carcinoma*. It is very rare for someone who has never smoked to have small cell lung cancer.

SCLC often starts in the bronchi near the centre of the chest, and it tends to spread widely through the body early in the course of the disease. This cancer is discussed in our document *Lung Cancer (Small Cell).*

Non-small cell lung cancer

About 85% to 90% of lung cancers are non-small cell lung cancer (NSCLC)[3]. There are 3main subtypes of NSCLC. The cells in these subtypes differ in size, shape, and chemical make-up. But they are grouped together because the approach to treatment and prognosis (outlook) are often very similar.

Lung cancer is a disease of abnormal cells multiplying and growing into a tumour. The mortality rate of lung cancer is the highest among all other types of cancer. Lung cancer is one of the most serious cancers in the world, with the smallest survival rate after the diagnosis, with a gradual increase in the number of deaths every year. Survival from lung cancer is directly related to its growth at its detection time. But people do have a higher chance of survival if the cancer can be detected in the early stages. Cancer cells can be carried away from the lungs in blood, or lymph fluid that surrounds lung tissue.

Objective of this study is to detect lung cancer using image mining techniques. CT scanned lung images of cancer patients are acquired from various hospitals. Using image mining techniques like pre-processing and mining, feature extraction, area of interest is separated.

Cancer that starts in the lung is called primary lung cancer. There are several different types of lung cancer.

Smoking

Tobacco[4] smoking is by far the leading cause of lung cancer. At least 80% of lung cancer deaths are caused by smoking, and many others are caused by exposure to second hand smoke. Smoking is clearly the strongest risk factor for lung cancer, but it often interacts with other factors. Smokers exposed to other known risk factors such as radon and as bestosare at even higher risk. Not everyone who smokes gets lung cancer, so other factors like genetics likely play a role as well (see below).

Lung cancer in non-smokers

Not all people who get lung cancer are smokers. Many people with lung cancer are former smokers, but many others never smoked at all. Lung cancer in non-smokers can be caused by exposure to radon, second-hand smoke, air pollution, or other factors. Workplace exposures to asbestos, diesel exhaust, or certain other chemicals can also cause lung cancers in some people who do not smoke. A small portion of lung cancers occur in people with no known risk factors for the disease. Some of these might just be random events that don't have an outside cause, but others might be due to factors that we don't yet know about. Lung cancers in non-smokers are often different in some ways from those that occur in smokers. They tend to occur at younger ages. Lung cancers in non-smokers often have certain gene changes that are different from those in tumors from smokers. Gene changes that may lead to lung cancer Scientists now know how some of the risk factors for lung cancer can cause certain changes in the DNA of lung cells. These changes can lead to abnormal cell growth and, sometimes, cancer. DNA is the chemical in each of our cells that makes up our genes –the instructions for how our cells function.

Signs and symptoms of lung cancer

Most lung cancers do not cause any symptoms until they have spread too far to be cured, but symptoms do occur in some people with early lung cancer. If you go to your doctor when you first notice symptoms, your cancer might be diagnosed at an earlier stage, when treatment is more likely to be effective.

The most common symptoms of lung cancer are:

- A cough that does not go away or gets worse
- Chest pain that is often worse with deep breathing, coughing, or laughing
- Hoarseness
- Weight loss and loss of appetite
- Coughing up blood or rust-colored sputum (spit or phlegm)
- Shortness of breath
- Feeling tired or weak
- Infections such as bronchitis and pneumonia that don't go away or keep coming back
- New onset of wheezing
- If lung cancer spreads to distant organs, it may cause:
- Bone pain (like pain in the back or hips)
- Nervous system changes (such as headache, weakness or numbness of an arm or leg, dizziness, balance problems, or seizures), from cancer spread to the brain or spinal cord
- Yellowing of the skin and eyes (jaundice), from cancer spread to the liver

. Lumps near the surface of the body, due to cancer spreading to the skin or to lymph nodes (collections of immune system cells), such as those in the neck or above the collarbone Most of the symptoms listed above are more likely to be caused by conditions other than lung cancer. Still, if you have any of these problems, it's important to see your doctor right away so the cause can be found and treated, if needed. Some lung cancers can cause a group of very specific symptoms. These are often described as *syndromes.*

Detection Methodology:
Lung Cancer is a disease of uncontrolled cell growth in tissues of the lung[5]. Detection of Lung Cancer in its early stage is the key of its cure. In general, a measure for early stage lung cancer diagnosis mainly includes those utilizing X-ray chest films, MRI[6],CT[7] etc. In many parts of the world widespread screening by CT or MRI is not yet practical, so that chest radiology remains in initial and most common procedure. Firstly, we will use main techniques are essential to the task of medical image mining**.**

Classification:

In recent years, many advanced classification approaches, such as neural networks, fuzzy-sets, expert system and SVM have been widely applied for image classification. In most cases, image classification approaches grouped as supervised & unsupervised machine learning approaches or parametric and non-parametric or hard and soft classification. The most used non-parametric classification approaches are neural networks, support vector machines & expert systems. Parametric classifier are robustness and easy to access for any image-processing software.

II.ASSOCIATIVE CLASSIFICATION:

Associative classification is a recent and rewarding technique which integrates association rule mining and classification to a model for prediction and achieves maximum accuracy. Associative classifiers are especially fit to applications where maximum accuracy is desired to a model for prediction. Association rule mining and classification are two main functionalities of data mining. Association rule mining is used to find associations or correlations among the item sets. It is a unsupervised learning where no class attribute is involved in finding the association rule. On the other hand, classification is a supervised learning where class attribute is involved in the construction of the classifier and is used to classify or predict the data unknown sample. Associative classification involves two stages.

- Generate class based association rules from a training data set
- Classify the test data set into predefined class labels.

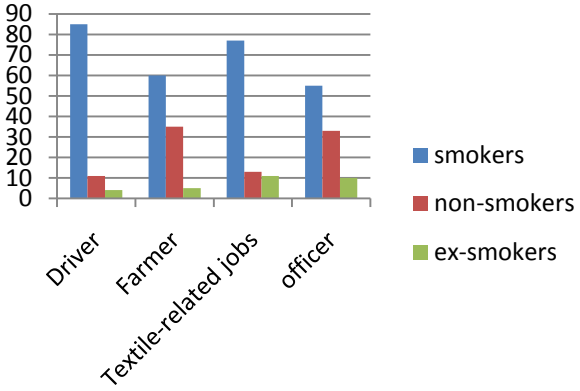
Image mining can automatically discover this implicit information and patterns from this high volume of images. Image mining is more than just an extension of data mining to image domain; it can be viewed as an interdisciplinary endeavour that draws upon computer vision, image processing, image retrieval, machine learning, artificial intelligence, database and data mining, etc. Research in image mining can be broadly classified into two main directions. The first direction involves domain-specific applications where the focus is to extract the most relevant image features into a form suitable for data mining [25, 26, 27]. The second direction involves general applications where the focus is to generate image patterns that may be helpful in the understanding of the interaction between high level human perceptions of images and low level image features.

Stages : Staging involves evaluation of a cancer's size and its penetration into surrounding tissue as well as the presence or absence of metastases in the lymph nodes or other organs. Staging is important for determining how a particular cancer should be treated, since lung-cancer therapies are geared toward specific stages. In stage I, the cancer is confined to the lung. In stages II and III, the cancer is confined to the chest (with larger and more invasive tumours classified as stage III) Stage IV, cancer has spread from the chest to other parts of the body used fuzzy clustering and support vector machine for lung nodule detection[6]. His work presents an image segmentation approach using standard Fuzzy C-Means (FCM), Fuzzy-Possibility C-Means and weighted Fuzzy-Possibility C-Means categories of features like geometric, texture and gradient. In medical diagnose, geometric features are essential to recognize any The objects. Therefore, to configure and distinguish ROI from others we need to know

its geometric features. The basic characters of geometric feature are area, perimeter and compactness. These are measured in scalar.

The patients were divided into 3 groups as non-smoker, ex-smoker, and smoker. Non-smokers are those who have never smoked as much as one cigarette, one cigar, or one pipeful of tobacco per day for lifetime.

The following data set value classified into the three categories in approximation in the past five years.



For example, total deaths worldwide caused by cancer each year;

Lung cancer---1,370,000 deaths
Stomach cancer----736,000 deaths
Liver cancer----695,000 deaths
Colorectal cancer----608,000 deaths
Breast cancer----458,000 deaths
Cervical cancer----275,000 deaths.

III.CONCLUSION

According to the various cancer diseases affect or caused by the people, most of the deaths are possibilities of lung cancer only. In feature, the high ratio of smokers among lung cancer patients indicates the importance of smoking in lung cancer not only for smokers including lot of non-smokers can be affect in the cancer diseases. we may try to any other method or any technique using with the help of image mining , some avoid may occur possible.
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