Histogram representation of carcinogenic diseases in a Human Lungs in spatial domain

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***Abstract*— This paper discusses the carcinogenic abnormalities of human lungs with the help of MRI (Magnetic Resonance Imaging) images by histogram analysis. Human lungs are a very important organ of the human body and need precise imaging.MRI is one of the methodologies to obtain quality images. We have developed a data set of histograms for normal and abnormal images of human lungs in time domain. We have marked the abnormal region area of the histogram .This paper further lead to the mathematical representation in spectral domain**

***Index Terms*—coronary blood vessels, Fourier spectrum Human lungs, Histogram, Magnetic resonance imaging.**

I. Introduction

MRI is short form Magnetic Resonance Imaging. It is a procedure used in hospitals to scan patients and determine the severity of certain injuries. MRI of the lung is recommended in a number of clinical indications. Having a non-radiation alternative is particularly attractive in children and young subjects, or pregnant women. An MRI machine uses a magnetic field and radio waves to create detailed images of the body. A strong magnetic field is created by passing an electric current through the wire loops. While this is happening, other coils in the magnet send and receive radio waves. This triggers protons in the body to align them. Once aligned, radio waves are absorbed by the protons, which stimulate spinning. Energy is released after "exciting" the molecules, which in turn emits energy signals that are picked up by the coil. This information is then sent to a computer which processes all the signals and generates it into an image. Unlike CT scanning or general x-ray studies, no ionizing radiation is involved with an MRI. Magnetic resonance imaging (MRI) is done for many reasons. It is used to find problems such as tumours' bleeding, injury,

Blood vessel diseases or infection. MRI also may be done to provide more information about a problem seen on an X-ray, ultrasound scan, or CT scan. MRI of the chest can look at the heart, the valves, and coronary blood vessels. It can show if the heart or lungs are damaged. MRI of the chest may also be used to look for breast or cancer. Magnetic resonance imaging (MRI) of the lung has been a challenge due to limitations such as low proton density in the lung and the fast signal decay due to susceptibility artefacts at air-tissue interfaces. The key technique for MRI of lung morphology is based on the resonant high-frequency signal of protons in tissues and liquids, so-called proton-MRI or 1H-MRI. The recent technical advances have helped MRI to challenge its well-known limitations as they are defined by low proton density in the lung and the fast signal decay due to susceptibility artefacts at air-tissue interfaces [6].

Image processing is one of most growing research area these days and now it is very much integrated with the medical and biotechnology field. Image Processing can be used to analyze different medical and MRI images to get the abnormality in the image

The human lungs are the organs of respiration in humans. The main function of the lungs is to allow oxygen from the air to enter the bloodstream for delivery to the rest of the body.Lung cancer is caused by uncontrolled cell growth in tissues of the lung. If left untreated, this growth can spread beyond the lung in a process called metastasis into nearby tissue and, eventually, into other parts of the body

II. EXPERIMENT WORK

In this experiment we take a MRI image of normal lungs and various abnormal lungs. And take a histogram of images using the Matlab Programming. And analysis the graph for various diseases

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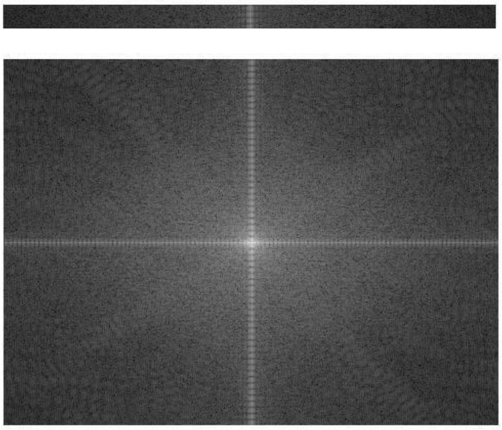
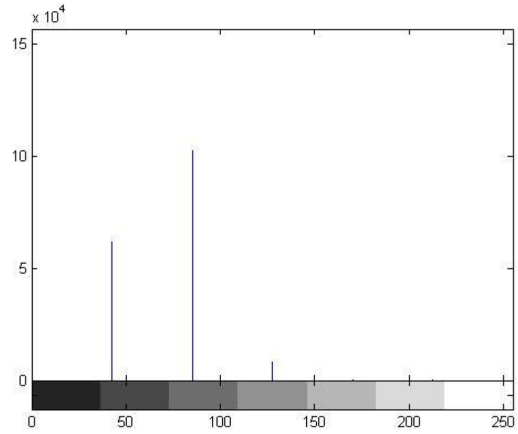
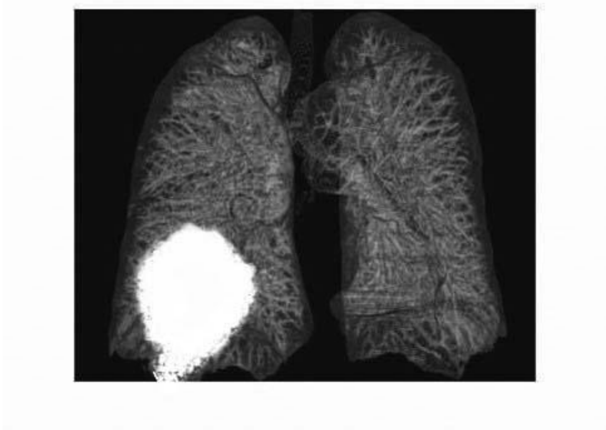
(g) Abnormal lungs (2)



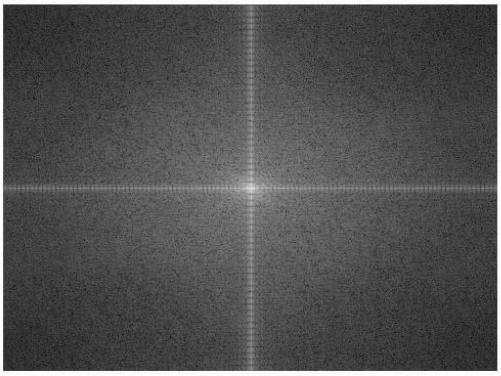
(h)Fourier spectrum of abnrmal Lungs (2)



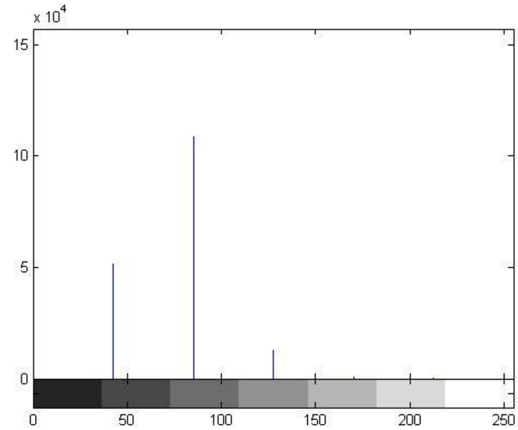
(i) Histogram of Fourier spectrum of abnormal Lungs (2)



(d) Abnormal lungs (1)



(e)Fourier spectrum of Abnormal Lungs



(f) histogram of fourier spectrum of abnormal Lungs

In above figure shows (a) normal lungs (b) Fourier spectrum of Normal Lungs (c) hisogram of fourier Spetrum of Normal Lungs(d) Abnormal lungs (1) (e)Fourier spectrum of Abnormal Lungs(f) histogram of Fourier spectrum of abnormal Lungs (g) Abnormal lungs (2) (h)Fourier spectrum of abnrmal Lungs (2) (i) Histogram

of Fourier spectrum of abnormal Lungs (2) (j) abnormal lungs (3) (k)Fourier spectrum of abormal Lungs (3) (l) histogram of Fourier spectrum of abnormal Lungs (3)

1. The corresponding Discrete time sequence of Normal Image histogram $x_1(n)$ = [.0176, 7.3042, 9.0240,0 .8984, 0.0443, 0.0034, 11.4349]*10^4
2. The corresponding Discrete time sequence of Abnormal Image (1) histogram $x_2(n)$ = [0.0086, 5.1238, 10.8388, 1.2542, 0.0612, 0.0053, 11.4349]*10^4
3. The corresponding Discrete time sequence of Abnormal Image (2) histogram $x_3(n)$ = [0.0084, 6.1680, 10.2346, 0.8230, 0.0453, 0.0038, 11.4347]*10^4
4. The corresponding Discrete time sequence of Abnormal Image (3) histogram $x_4(n)$ = [0.0036, 3.2221, 12.7756, 1.2269, 0.0594, 0.0043, 11.4349]*10^4

III. GENERATION OF HISTOGRAM

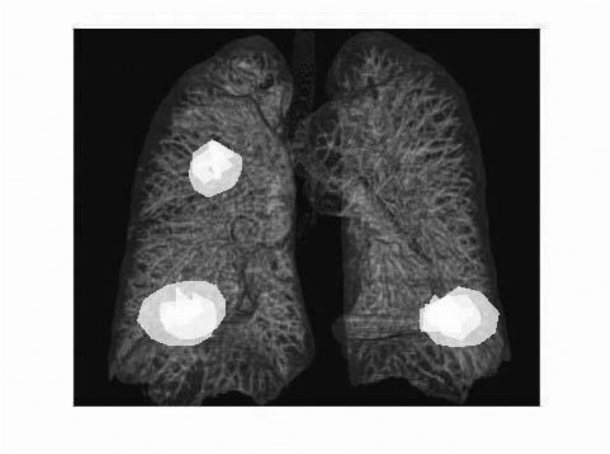
```
l=imread('normal image.jpg');
>> imshow(l);
>> F=fft2(l);
>> S=abs(F);
>> Fc=fftshift(F);
>> S2=log(1+abs(Fc));
>> imshow(S2,[ ])
k=imread('Fourier spectrum of Normal Lungs');
>>imhist(k)
```

IV. RESULT

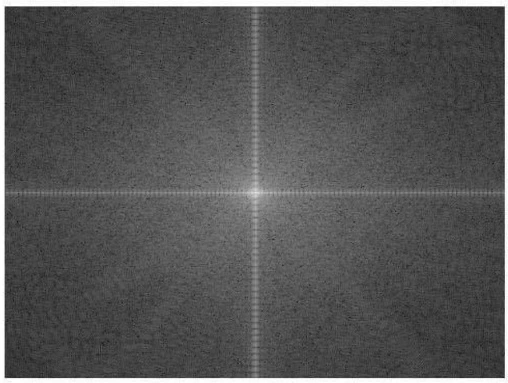
We have analysed the histogram for the three location disturbances in human lungs and computed with the normal histogram. The region of abnormality has shown in the abnormal histogram this doesn't show the location on spatial domain but give inference in histogram only by the virtue of which we can develop a mathematical function in frequency or spectral domain

V. DISCUSSION

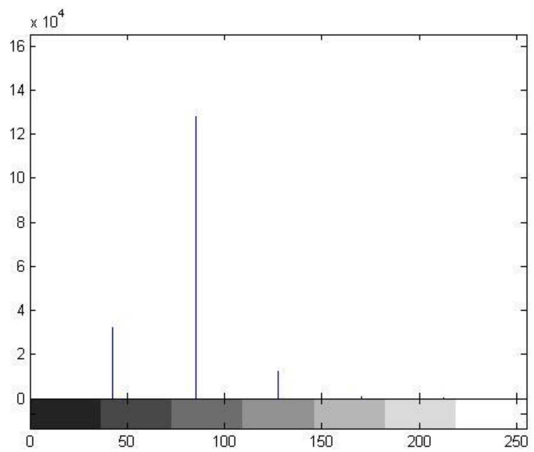
The important thing is to be able to interpret accurately test for a patient. The main advantage of this paper we know the histogram of various disease .These results are very useful for Physician to overcome the abnormality level by using regular therapy and proportional medicine to the patient.



(j) abnormal lungs (3)



) (k) Fourier spectrum of abormal Lungs (3)



(l) histogram of Fourier spectrum of abnormal Lungs (3)

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