

# DIGITAL IMAGE PROCESSING

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**TITLE-Detection of fluid filled regions in chest x-rays images.**

**AIM:** Detection of fluid filled regions in chest x-rays images using MATLAB.

**MATERIALS REQUIRED:**

MATLAB R2020b, Personal Computer.

**ALGORITHM:**

- Step 1: Read the image using imread ().
- Step 2: Display the color image using imshow ()
- Step 3: Convert the color image into RGB image using rgb2gray ().
- Step 4: Display the gray scale image using imshow ().
- Step 5: Convert the image into black and white image using im2bw ().
- Step 6: Display the black and white image using imshow ().
- Step 7: Inserting Horizontal Threshold line.
- Step 8: Inserting Vertical Threshold lines.
- Step 9: Infection detection.
- Step 10: Run and view the output.

**PROGRAM:**

Will send an algorithm tomorrow.

**PROGRAM**

```
% 1.Clearing instances
clc;
clear all;
close all;

% 2.Loading the image under Test
im01 = imread('C:\Users\Home\Downloads\2.jpg');
subplot(2,3,1);
imshow(im01);
```

```

title('Input Image');

% 3.Converting the Colour Image to Grayscale Image
im02 = rgb2gray(im01);
subplot(2,3,2);
imshow(im02);
title('Grayscale Image');

% 4.Converting the Grayscale Image to BW Image
im03 = imbinarize(im02,0.5);
subplot(2,3,3);
imshow(im03);
title('BW Image');

% 5.Inserting Horizontal and Vertical Threshold lines
im04 = im03;
im05 = im03;
[row,col] = size(im04);
hpt = round(row*0.6);
for i=1:col
    im04(hpt-1:hpt+1,i)=0; %Horizontal Threshold Line
end
hpt = hpt+1;

vpt1=round(col*0.25);
for j=row:-1:1
    im04(j,vpt1-1:vpt1+1)=0; %Vertical Threshold Line 01
end

vpt2=round(col*0.8);
for k=row:-1:1
    im04(k,vpt2-1:vpt2+1)=0; %Vertical Threshold Line 02
end
subplot(2,3,4);
imshow(im04);
title('Threshold Lines');

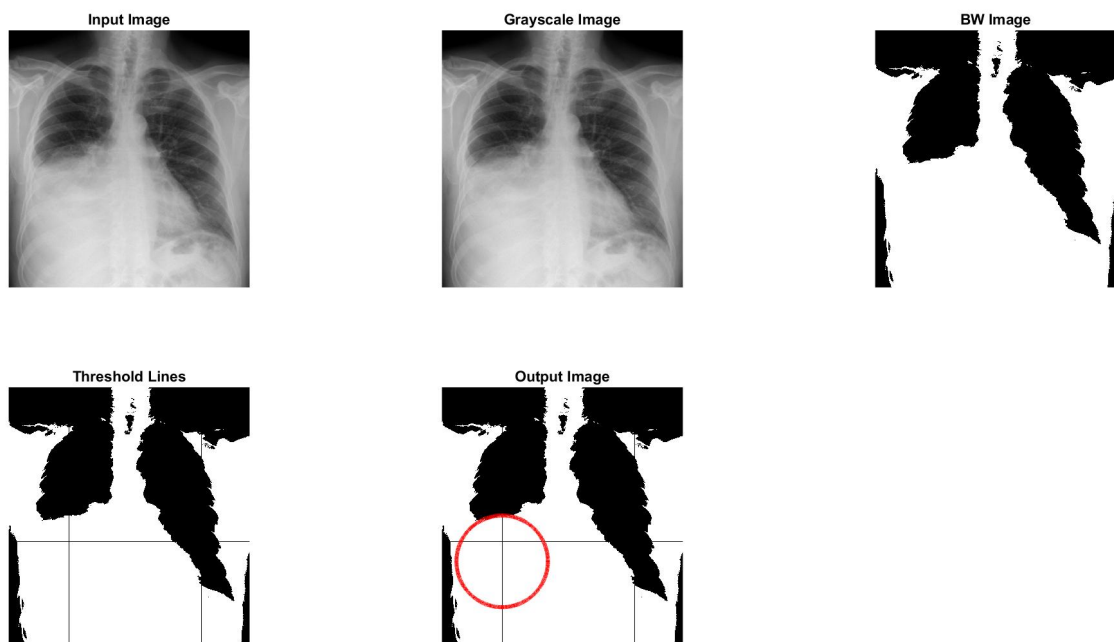
%infection detection for PRL
p=row;
while (im05(p,vpt1) ~= 0)
    % disp(im05(p,vpt1-1:vpt1+1));
    %im05(p,vpt1-1:vpt1+1)=0;
    if(im05(p,vpt1) == 0)
        break
    end
    p=p-1;
end

subplot(2,3,5);
imshow(im04);
title('Output Image');

if(p<hpt)
r = 200;
hold on;
theta = 0 : (2 * pi / 10000) : (2 * pi);
pline_x = r * cos(theta)+vpt1;
pline_y = r * sin(theta)+p+r;
plot(pline_x, pline_y, 'r-', 'LineWidth', 3);
hold off;
end

```

## OUTPUT:



## RESULT:

Thus a program to detect fluid filled regions in chest x-rays images using MATLAB was written and output verified.