

EXPERIMENT NO -02

AIM OF THE EXPERIMENT: Display the grayscale image and perform geometric transformations such as translation, rotation, scaling, and crop using MATLAB.

OBJECTIVE: To know how to display the grayscale image and to know the importance of geometric transformation for example translation, rotation, scaling, and crop using MATLAB.

EQUIPMENT REQUIRED:

- A personal computer installed with Windows 10
- MATLAB /SCILAB

THEORY: Definition and importance of following Image Scaling: Image scaling refers to the resizing of a digital image. It has several applications in the field of image processing. Image Rotation: Image rotation is a common image processing routine with applications in matching, alignment, and other image-based algorithms. The input to an image rotation routine is an image, the rotation angle θ , and a point about which rotation is done. Image Translate: Image translation is used to improve the visualization of an image, but also has a role as a preprocessor in applications where registration of two or more images is required. Image translation is a special case of an affine transformation.

```
clc
clear all
close all
%read image
a=imread('pout.tif');
figure
imshow(a);
%resize image
b=imresize(a,[10 10]);
figure
imshow(b);
c=imresize(b,[255 255]);
figure
imshow(c);
d=a+150;
figure
imshow(d);
```

```
e=imread('lenna.jpg');  
figure  
imshow(e);  
f=rgb2gray(e);  
figure  
imshow(f);
```

```
2)%read an image
```

```
x=imread('cameraman.tif');  
figure  
imshow(x);
```

```
[r c]=size (x);  
B = imresize(x,[r c]);  
imwrite(x, strcat('C:\Users\lenovo\Desktop\','test.jpg')  
);
```

```
b=imtranslate(a,[50,25]);  
figure  
imshow(b);
```

```
z=imrotate(a,45);  
figure  
imshow(z);
```

```
y=imresize(a,[50 50]);  
figure  
imshow(y);
```

```
w=imcrop(a,[60 40 100 90]);  
figure  
imshow(w);
```

```
v=imcomplement(a);
```

```
figure
imshow(v);
```

3) Translation without inbuilt function

```
%%% translation
clc
clear all
close all
a=imread('cameraman.tif');
[r,c]=size(a);
for i=1:r
    for j=1:c
        if (i+15<=r && j+25<=c)
            im(i+15,j+25)=a(i,j);
        end
        if (i<15 && j<25)
            im(i,j)=0;
        end
    end
end
figure
imshow(a);
title('original image');
figure
imshow(im);
title('translated image');

%%scaling
clc
clear all
close all
a=imread('cameraman.tif');
[r,c]=size(a);
x=1;%initialise the index for the scaled image.
y=1;
for i=1:2:r
    for j=1:2:c
        im(x,y)=a(i,j);
        y=y+1;
    end
end
```

```
        x=x+1;  
        y=1;  
end  
figure  
imshow(a);  
title('original image');  
figure  
imshow(im);  
title('scaled image');
```

OBSERVATIONS:

Original Image



Fig.1: Test image “Cameraman” size 256x256,

translated Image



Rotated Image



Fig.2: (a)Translated Image

(b) Rotated Image

Cropped Image



Image Negative



Fig.3: (a)Cropped Image

(b) Image Negative

CONCLUSION: In the above experiment, we perform image transformation such as translation, rotation, scaling, and crop using MATLAB.

Date of Submission

NAME:

REG. NO.:

GROUP: