



**UNIVERSITY OF ENGINEERING AND TECHNOLOGY TAXILA**  
**FACULTY OF TELECOMMUNICATION AND INFORMATION ENGINEERING**  
**Computer Engineering Department**

---

# **DIGITAL IMAGE** **PROCESSING**

## **LAB MANUAL 1**

Introduction To Digital Image Processing Using  
Matlab

Prepared By: Engr. M J Khan



## **DIGITAL IMAGE FUNDAMENTALS**

### **Lab Objectives**

This objective of this lab is to understand

1. How to read an image in Matlab.
2. How to show an image in Matlab.
3. How to access Image Pixels in Matlab.
4. How to write Image in Matlab.
5. Mirror Image generation.
6. Flipped Image generation.

### **Reading an Image**

To import an image from any supported graphics image file format, in any of the supported bit depths, use the `imread` function.

#### **Syntax**

```
A = imread(filename,fmt)
```

#### **Description**

`A = imread(filename,fmt)` reads a greyscale or color image from the file specified by the string `filename`, where the string `fmt` specifies the format of the file. If the file is not in the current directory or in a directory in the MATLAB path, specify the full pathname of the location on your system.

### **Display An Image**

To display image, use the `imshow` function.

#### **Syntax**

```
imshow(A)
```

#### **Description**

`imshow(A)` displays the image stored in array `A`.



## Writing Image Data

### Imwrite

Write image to graphics file

### Syntax

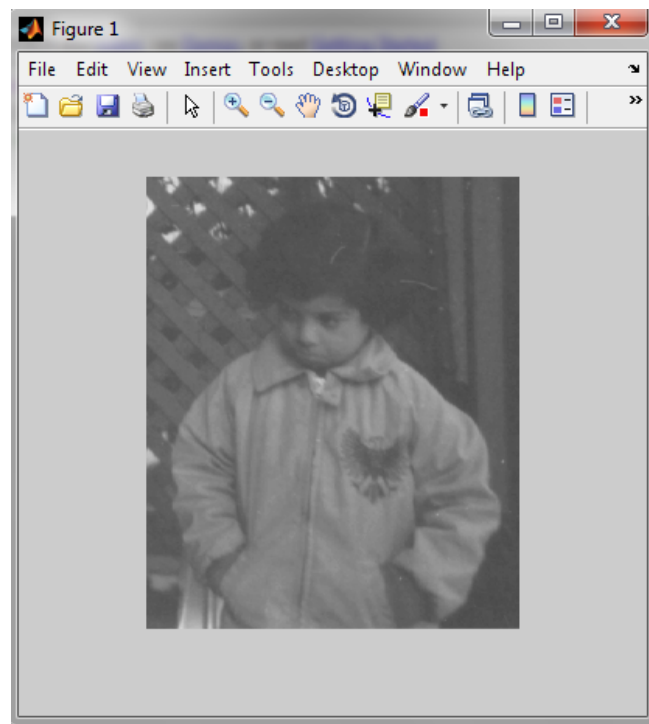
```
imwrite(A,filename,fmt)
```

### Example:

```
a=imread('pout.tif');
```

```
imwrite(a,gray(256),'b.bmp');
```

```
imshow('b.bmp')% imshow is used to display image
```



Writing Image to Disk

## How to get no. of rows and columns of image

Function **size** gives the rows and columns dimension of image

```
[r,c]=size(a)
```

```
r =
```



291

c =

240

### Accessing the Pixel data

There is a one-to-one correspondence between pixel coordinates and the coordinates MATLAB® uses for matrix subscripting. This correspondence makes the relationship between an image's data matrix and the way the image is displayed easy to understand. For example, the data for the pixel in the fifth row, second column is stored in the matrix element (5,2). You use normal MATLAB matrix subscripting to access values of individual pixels. For example, the MATLAB code

```
A(2,15)
```

returns the value of the pixel at row 2, column 15 of the image A.

### MIRROR IMAGE GENERATION

```
% this program produces mirror image of the image passed to it n also
```

```
% displays both the original and mirror image
```

```
a=imread('pout.tif');
```

```
[r,c]=size(a);
```

```
for i=1:1:r
```

```
    k=1;
```

```
    for j=c:-1:1
```

```
        temp=a(i,k);
```

```
        result(i,k)=a(i,j);
```

```
        result(i,j)=temp;
```



```
k=k+1;  
  
end  
  
end  
  
subplot(1,2,1),imshow(a)  
  
subplot(1,2,2),imshow(result)
```



Source Image and resultant One

\*\*\*\*\*

### TASK 1

Write a MATLAB code that reads a gray scale image and generates the flipped image of original iamge. **Your output should be like the one given below**



Source Image with Desired Output

\*\*\*\*\*

## TASK 2

Write a MATLAB code that will do the following

1. Read any gray scale image.
2. Display that image.
3. Again display the image such that the pixels having intensity values below than 50 will display as black and pixels having intensity values above than 150 will display as white. And the pixels between these will display as it is.

\*\*\*\*\*