Spatial Resolution &Intensity Resolution using MATLAB

Outline

- Spatial Resolution using MATLAB
- Intensity Resolution using MATLAB

Spatial Resolution

```
I='lena.jpg'; % 512 *512
I=imread(I);
% I=imresize(I,[512 512]);
```

```
figure,imshow(I);title('512 x 512(original)');
```

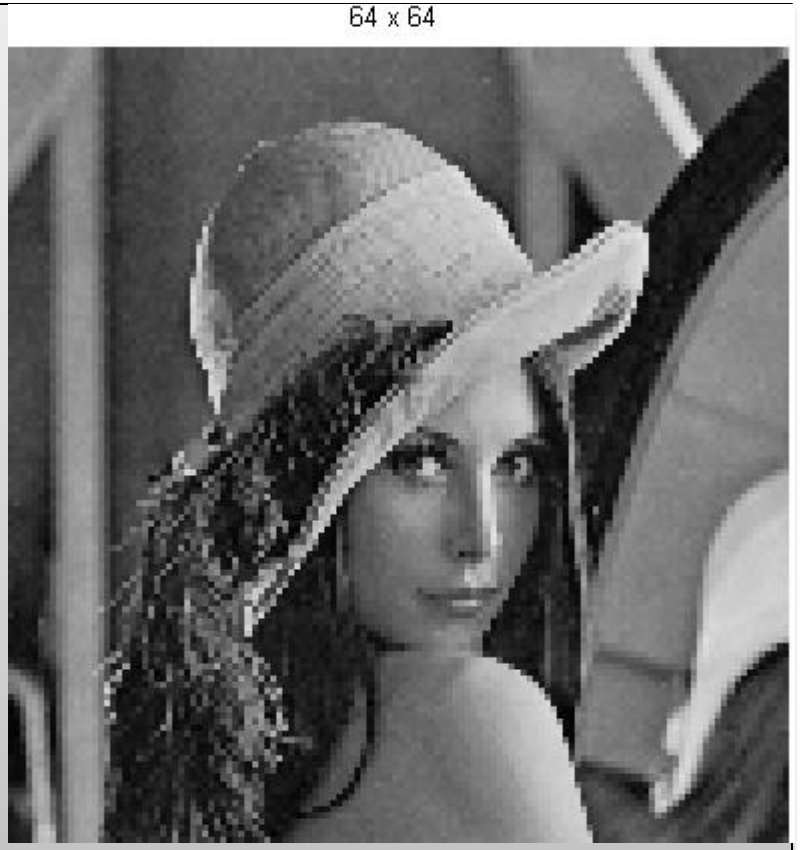
Spatial Resolution

```
a1 = 2;
i1 = 1:a1:512;
I1 = I(i1,i1);
figure,imshow(I1);title('256 x 256');

a2 = 4;
i2 = 1:a2:512;
I2 = I(i2,i2);
figure,imshow(I2);title('128 x 128');
```

The MATLAB consists of five main parts

```
a3 = 8;
i3 = 1:a3:512;
I3 = I(i3,i3);
```




```
figure,imshow(I2);title('64 x 64');
```

Intensity Resolution

Intensity Resolution

```
I=uigetfile('*.*','Select the Image');
I=imread(I);
[r c] = size(I);
L1 = 1; %total number of levels
y1 = uint8(255/L1); %number of gray shades per level
x1 = 0:y1:255; %gray levels in output image
 I1 = zeros(r,c);
```

Intensity Resolution

```
for i = 1:1:r
      for j = 1:1:c
         k = uint8(I(i,j)/y1);
         k = k+1;
      if (k > L1+1)
         k = k-1;
      end
         I1(i,j) = x1(k);
      end
   end
 figure,imshow(uint8(I1));title([num2str(nn1),' bit image']);
End
%nn1 is missing
```

Intensity Resolution

1 bit image

Intensity Resolution

2 bit image

Intensity Resolution

8 bit image

7 bit image

6 bit image

5 bit image

4 bit image

3 bit image

2 bit image

1 bit image

Connected component labeling

L = bwlabel(BW, n)

- L = bwlabel(BW, n) returns a matrix L, of the same size as BW, containing labels for the connected objects in BW. The variable n can have a value of either 4 or 8, where 4 specifies 4-connected objects and 8 specifies 8-connected objects. If the argument is omitted, it defaults to 8.

Connected component labeling

```
BW = logical ([1 1 1 0 0 0 0 0
1 1 1 0 1 1 0 0
1 1 1 0 1 1 0 0
1 1 1 0 0 0 1 0
1 1 1 0 0 0 1 0
1 1 1 0 0 0 1 0
1 1 1 0 0 1 1 0
1 1 1 0 0 0 0 0]);
```

Connected component labeling

L = bwlabel(BW,4);

L = 1 1 1 0 0 0 0 0

1 1 1 0 2 2 0 0

1 1 1 0 2 2 0 0

1 1 1 0 0 0 3 0

1 1 1 0 0 0 3 0

1 1 1 0 0 0 3 0

1 1 1 0 0 3 3 0

1 1 1 0 0 0 0 0

Connected component labeling

```
[r, c] = find(L==2);
rc = [r c];
rc = 2 5
3 5
2 6
3 6
```

Thank you