Lab Objectives

This objective of this lab is to understand

1. The effect of **changing the intensity resolution (number of gray levels)** on the quality of images.

2. The effect of changing **spatial resolution** on the quality of images, using **Nearest neighbor interpolation**.

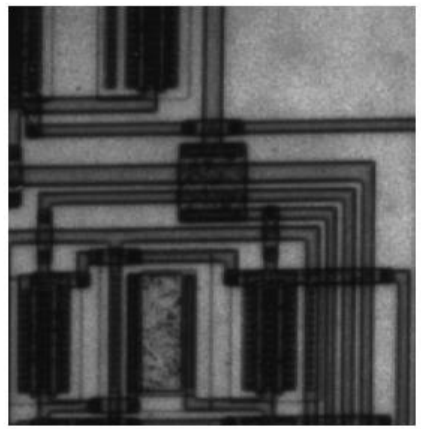
Example :Changing the number of gray Levels

```
% Changing the Gray Resolution From 256 to 2
I = imread('cameraman.tif');
K= imfinfo('cameraman.tif');
if(K.BitDepth ==24)
        I=rgb2gray(I);
end
[r,c] = size(I);
I2= uint8(zeros(r,c));
for i = 1:r
    for j=1:c
        if (I(i,j)>128)
            I2(i,j) =255;
        else
            I2(i,j) =0;
        end
    end
end

figure,
subplot(121),imshow(I);
subplot(122),imshow(I2);
```

Changing the number of gray Levels from 256 to 2

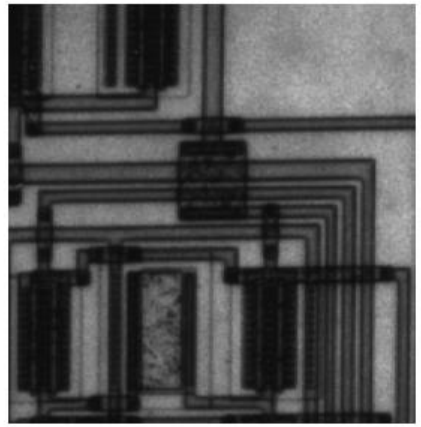
Changing the Spatial Resolution

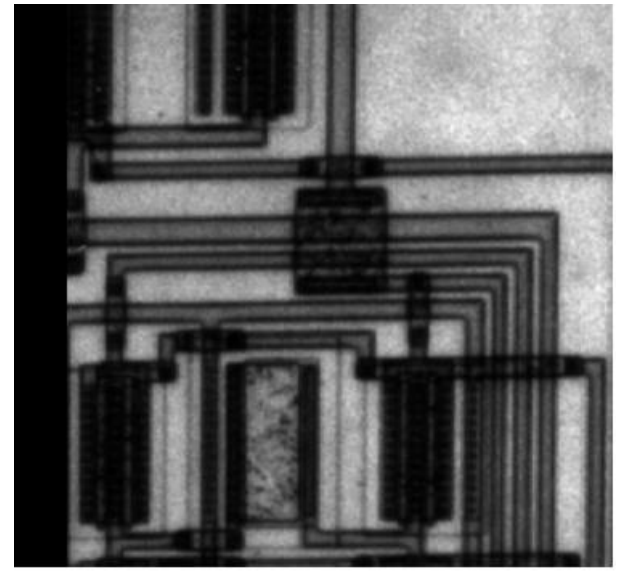
```
% Resize the image
I = imread("circuit.tif");

figure,
subplot(221),imshow(I);
```



Changing the Spatial Resolution

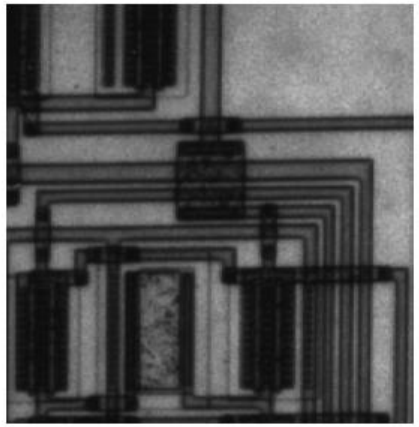
```
% Resize the image
I = imread("circuit.tif");
figure,
subplot(221),imshow(I);


ScaleFactor = 1.25;
J = imresize(I, ScaleFactor);
subplot(222),imshow(J);
```

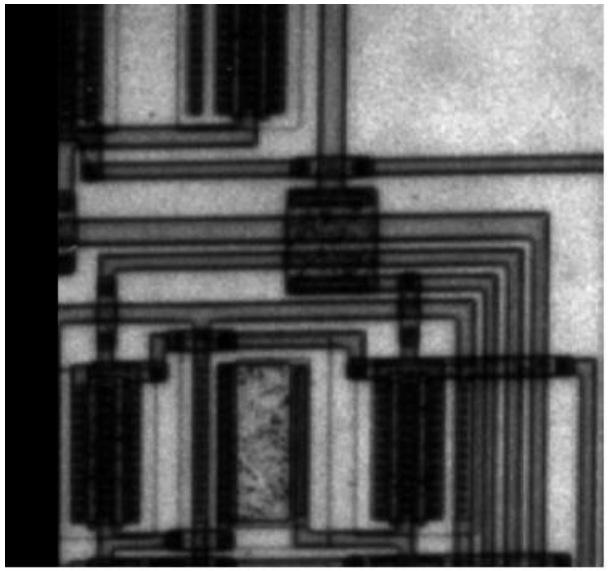


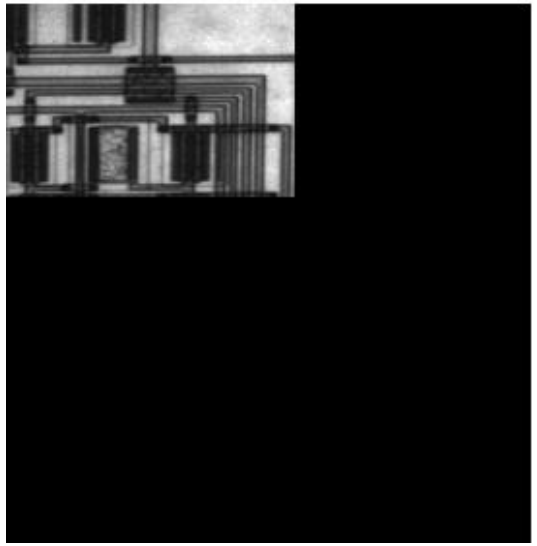


Changing the Spatial Resolution

```
% Resize the image
I = imread("circuit.tif");
figure,
subplot(221),imshow(I);


ScaleFactor = 1.25;
J = imresize(I, ScaleFactor);
subplot(222),imshow(J);


K = imresize(I,[100 150]);
subplot(223),imshow(K);
```

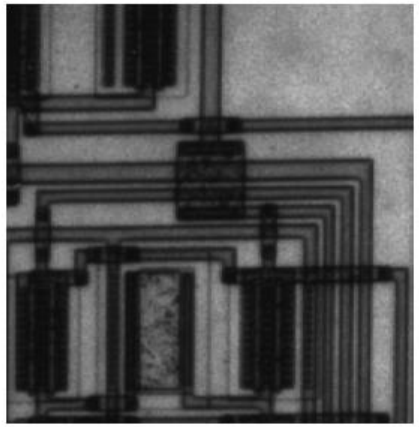


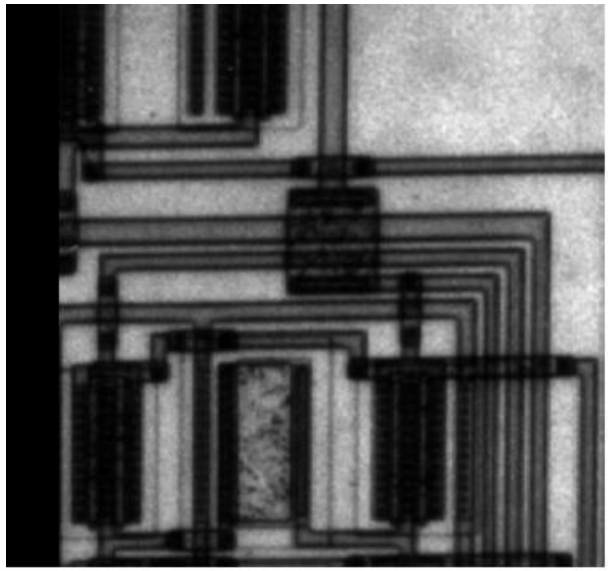


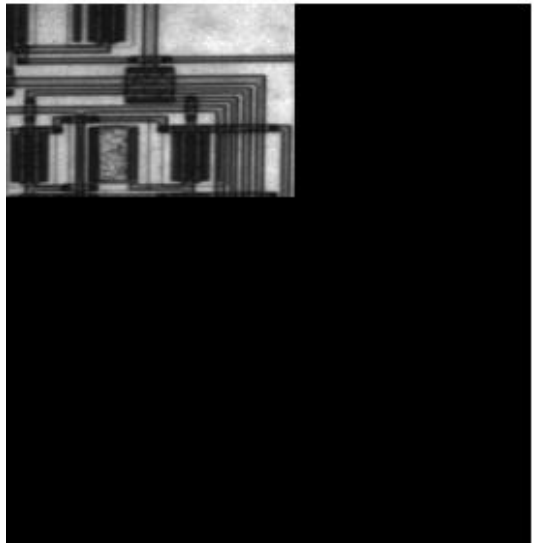


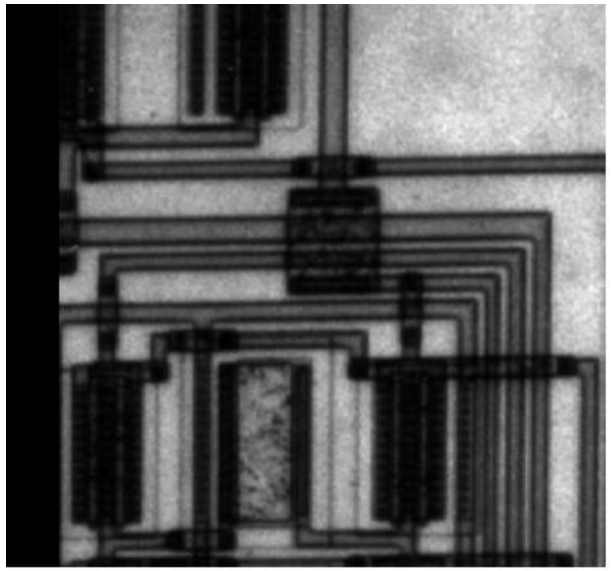
Changing the Spatial Resolution

```
% Resize the image
I = imread("circuit.tif");
figure,
subplot(221),imshow(I);

ScaleFactor = 1.25;
J = imresize(I, ScaleFactor);
subplot(222),imshow(J);

K = imresize(I,[100 150]);
subplot(223),imshow(K);

L = imresize(I,ScaleFactor,"nearest");
subplot(224),imshow(L);
```









Changing the Spatial Resolution

```
% Shrinking the image to 1/2
I = imread('cameraman.tif');
K= imfinfo('cameraman.tif');
if(K.BitDepth ==24)
        I=rgb2gray(I);
end
[r,c] = size(I);
I2(1:r/2, 1:c/2) = I(1:2:r, 1:2:c);
figure,
subplot(121),imshow(I);
subplot(122),imshow(I2);
```