

***COMPSCI.373***  
***Tutorial 9***

Basic Image Processing with ImageJ

# ***1. ImageJ array***

Write an imageJ macro that loads “8-bit” image “test.png” from disk and copies all image data into an array. Then display the value of the original image at pixel (50,50) on the screen along with the same value extracted from the array.

## 2. Histograms

- Name some uses of histograms.
- Given the grid-based representation of an image below. Assume that the top Left corner is (0,0) and that the y axis goes down the page.

2	2	128
2	8	128
8	32	128

- What is the intensity of pixel (1,2)?
- Given histogram H. What is the value of H(8)?
- What is the value of  $H(2) + H(8) + H(32) + H(128)$ ?

### ***3. Histogram ImageJ***

Write an imageJ macro that loads “8-bit” image “test.png” from disk and reads a histogram of the image into an array.

## *4. Cumulative Histogram ImageJ*

Write an imageJ macro that loads “8-bit” image “test.png” from disk and computes the cumulative histogram in an array. **Assume that you already have a histogram stored in array hist.**

## ***5. Image Negation***

Write an imageJ macro that loads “8-bit” image “test.png” from disk and negates the image.

## ***6. Contrast stretching***

- Given an “8-bit” image,  $f(x,y)$ , with a minimum intensity of 50 and a maximum intensity of 101. If we define a mapping  $g(x,y) = af(x,y) + b$ , then what values should  $a$  and  $b$  have to allow  $g(x,y)$  to have a minimum intensity of 0 and a maximum intensity of 255.