Institute of Bioinformatics and Applied Biotechnology (IBAB)
Semester 2: Term End Examination

PGDB204 Image Informatics Laboratory

Maximum Marks :50 **Time : 90 minutes**

Instructions

(a) Work only with the given images
(b) Document all intermediate results
(c) Write your conclusions/observations clearly
(d) Make a clear document containing codes, intermediate results and conclusions as a pdf with your name and register number. Please make one document for questions 1 and 2 and another document for questions 3 and 4.

1) Read the image shown below. Call it I_orig. (10 marks)

Now do the following:

a) Interpolate using “Nearest Neighbour” by factor 4. Call it I_NN

b) Interpolate using “Bilinear” by factor 4. Call it I_BL

(c) Compare the two resulting images, I_NN and I_BL. Find the Fourier transform of I_NN, call it FI_NN. Find the Fourier Transform of I_BL, call it FI_BL.

Do you notice anything, either in the image domain or in the Fourier domain that can help you conclude which of the two interpolation techniques is superior?

2) Read the image shown below. (10 marks)

Call it I_low. Now extract the foreground (single flower) using Otsu’s threshold, T_low. Run Histogram Equalization of I_low to obtain a new image I_HE. Now again extract the foreground (single flower) using Otsu’s threshold, T_high. Compare the results.

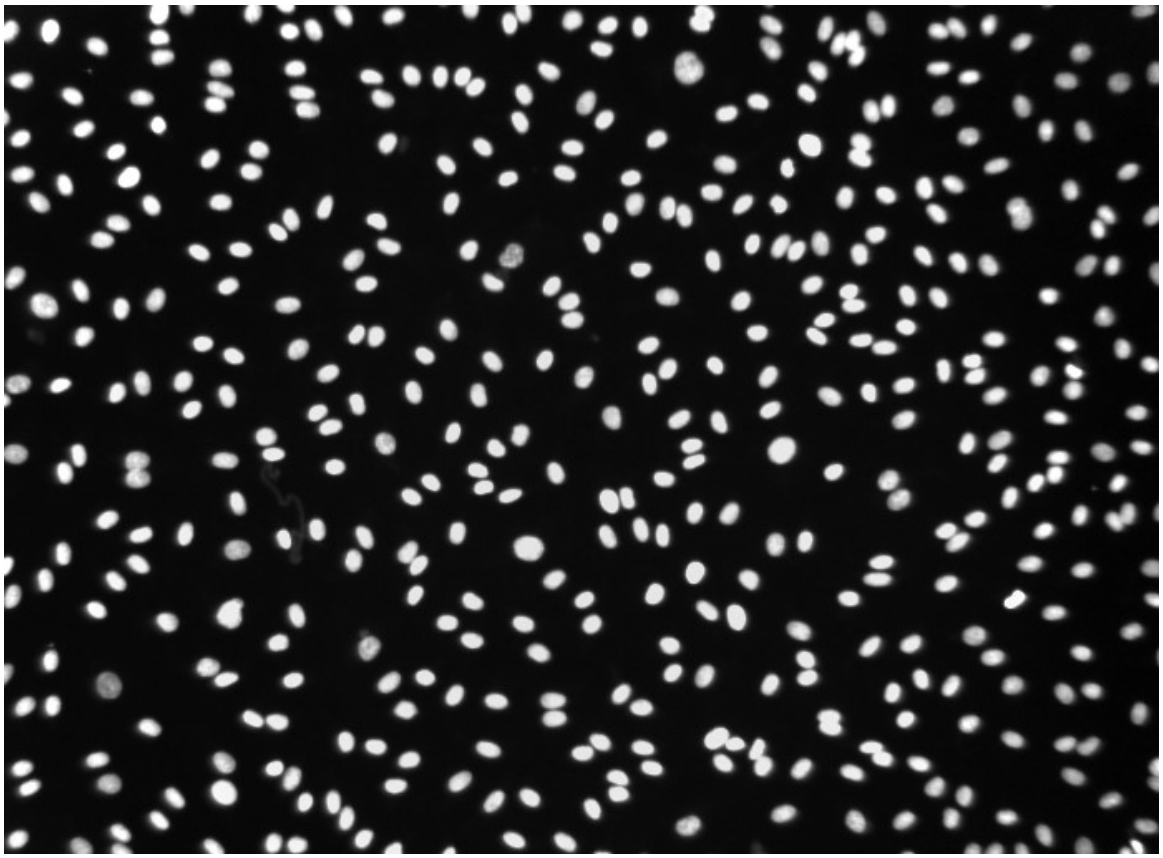
3. (a) Use Fiji (ImageJ) to count the number of particles in the given image. (20 marks)

(b) Explain the different steps used to arrive at the number.

(c) What were the threshold levels set by you during the counting?

(d) Calculate the area and intensity of each of the particles in the image and tabulate them

(e) Plot the mean intensity versus mean area of the particles in the image provided.



4. Convert the image to jpeg and to tiff formats. What changes were observed in image characteristics? Is the resolution compromised? Why do these parameters show a change? (10 marks)