MSCSIT

Exercise 2

1. Load the images *pollen.tif* and *bone-scan-GE.tif*. Display them with imtool. Look at the pixel values in some area. Convert them into double. Display and look at the values again.
2. Use thresholding and regionprops to count the nuclei in the following images:

nuclei.tif

nuclei2.tif

How many nuclei are there in the picture?

What is the average area of a nucleus?

Which image was easier? Why? How can the segmentation be improved?

Try to write your programs in a generic fashion.

Comment and maybe even include functions.

Tips: Once the image has been labeled, use the **regionprops** command to obtain quantitative

information about the objects:

**D = regionprops(L, properties)**

There’s a lot of useful statistical information about objects that can be extracted using

**regionprops**. Here’s a list:

'Area' 'EulerNumber' 'Orientation'

'BoundingBox' 'Extent' 'Perimeter'

'Centroid' 'Extrema' 'PixelIdxList'

'ConvexArea' 'FilledArea' 'PixelList'

'ConvexHull' 'FilledImage' 'Solidity'

'ConvexImage' 'Image' 'SubarrayIdx'

'Eccentricity' 'MajorAxisLength'

'EquivDiameter' 'MinorAxisLength'

1. Eliminate “bad” rice granules from the rice.png picture.

Use regionprops to identify the rice you want to eliminate.

Use the find function to change eliminate these grains from the labeled image.

(You will probably want to write a loop that goes through each object in the labeled file)

Compare the original image to your new image (imshow and hist).

1. How well did you do? Qualitatively, how many real grain got eliminated/how many bad grains remain?