Simple feature extraction from dermoscopy images

A number of RGB dermoscopy images, as well as the segmentation of the lesion (binary .png image) are provided. The images were taken from the "ISBI 2016: Skin Lesion Analysis Towards Melanoma Detection", https://challenge.kitware.com/#challenge/560d7856cad3a57cfde481ba

For each one of the segmentation images, calculate the following:

1. the number of pixels in the boundary, the number of non zero pixels, as well as the circularity of the shape.
2. the asymmetry of the shape along its major and minor axis. The asymmetry of a shape along any given axis is defined as following:

   The (number of non-zero pixels, lying at one side of the axis, whose symmetric pixel is non-zero) / the total number of non-zero pixels, lying at one side of the axis.

For each one of the RGB images, convert to gray level and calculate the following:

1. the gray-level histograms of the images
2. Divide the images into 9 sectors emanating from the center of mass of the lesion and calculate the gray-level histogram of each sector.
   a. Compare the histograms
   b. Derive a measure for the angular asymmetry of the histograms
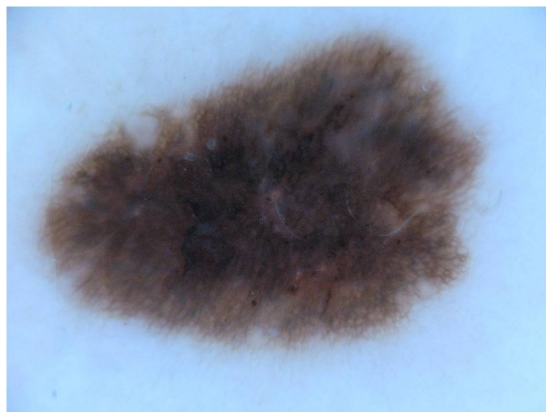
RGB image   Segmented imaage

Instructions

You should submit in e-class (not by email) the following:

The source code, with clear comments and a report with all your results, as well as detailed explanations.

The source code should execute and produce identical results with the ones submitted.

You may use functions from software libraries. You may be orally examined over your code and results, so, do no use functions / parts of source code you do not understand.