ECE 435/BME 403 Medical Image Processing Spring 2019
University of Victoria

Assignment 4. (6% of final course mark)
Due date: Thursday March 21 6:00 pm via CourseSpaces

For this assignment, you need to hand out the following files (in a ZIP file):

- one .m file containing the Matlab code for the algorithm implemented at point 1) ; the .m file needs to be functional, so I can run it and obtain the same results as you have submitted. The .m file needs to be a MATLAB function, not a script. The output of the function needs to be the segmented binary image.
- two image files with the result of processing "angiogram.tif" with and without histogram equalization as a pre-processing step. Label these files so that I can understand easily which output corresponds to which algorithm.
- one pdf file containing your responses to points 2, 3, and 4. Include the output images as figures in this file, and reference these figures in your discussion.

1. Implement the algorithm on Basic Global Thresholding described in L8.1. The implementation of your algorithm needs to specify a tolerance percentage below which the thresholds T(i+1) and T(i) are considered identical. This tolerance parameter needs to be an input for your function.

2. Test the algorithm on the image 'angiogram.tif'. You will provide the following results:
   a) The binarized image with the value of the threshold at convergence
   b) The histogram of 'angiogram.tif' image with the value of the threshold specified on it.
   c) A table containing the value of the threshold at every iteration before reaching convergence.

3. Apply histogram equalization to 'angiogram.tif'. You may choose to work with the Matlab **`histeq`** function. Next, apply the same thresholding algorithm to the equalized image. Compute the new threshold, and the new binarized image.

4. Compare and discuss the results obtained by optimal thresholding on the original image, and on the image pre-processed with histogram equalization.