**CM0669 Machine Learning and Computer Vision**

**Lab 10** Image segmentation using machine learning

Open up Matlab and Type in ‘help graythresh. A helpful description will be given on the built-in function ‘graythresh’ for finding a threshold to separate the objects from the background (see segmentation based on thresholding in lecture 10). Download the Matlab codes and the test images in a new folder ‘Week10’.

**1. Greylevel Image segmentation by thresholding**

Run the Matlab codes ‘Greylevel\_segmentation\_local\_thresholding.m’ and ‘Greylevel\_segmentation\_global\_thresholding.m’ on all test images. Analyse and interpret the results.

**2. Greylevel Image segmentation by clustering (K-means clustering)**

Run the Matlab codes ‘Greylevel\_segmentation\_clustering.m’ and on all test images for different values of block size and number of clusters (default values are 2 and 3, respectively). Analyse and interpret the results.

**3. Texture Image segmentation by clustering (K-means clustering)**

1. Run the Matlab codes ‘Texture\_segmentation\_clustering.m’ and on all test images for different values of block size and number of clusters (default values are 4 and 3, respectively). Analyse and interpret the results.

2. Instead of using high pass filters, write a modified Matlab code which extracts the features in the DWT domain. Use block size=8 (it means 8×8), each block is DWT transformed with two decomposition levels using the Haar wavelet. The feature vector consists of the mean and standard deviation of the resulting sub-bands excluding the approximation one. Execute the code and interpret the results.