TNM087 – Image Processing and Analysis
Lab 4

TASK 3 – Segmentation, object features and classification

In this task you are given images containing grains of rice and macoronis in two different sizes. The rice and macaronis can be considered as objects of three different classes, i.e. *rice*, *small macaronis* and *large macaronis*. Your task is to modify the code in *CountObjects.m* to segement the grains of rice and the macaronis from the background, and classifiy each objects into the different classes based on object features. After classification, you should return the number of objects belonging to each class, as well as an image displaying the objects in different colors.

Since the methods required to perform this task had been introduced in the preparations (and/or other previous tasks), we keep these instructions short. If you have finished (and understood) the previous tasks, you should have no problem solving thits task using a similar methodology.

We recommend you to follow the following steps:

1. Convert the input RGB color image to gray scale, e.g. by selecting a color channel where the objects have high contrast to the background. Segment the grayscale image into a binary image, using an appropriate threshold.
2. Remove noise and make sure that your segmented image cotains only the relevant objects. Remember that also single foreground pixels will be labelled as objects.
3. Label the objects.
4. Compute relevant object features that can be used for classification.
5. Classify the objects based on object features and count the number of objects for each class.
6. Create an RGB-image displaying the different classes of objects in different colors.

Your code should be general enough to return the correct number of objects for the three test mages images:

Image	**Rice**	**Small macs**	**Large macs**
MacnRice1.tif	48	12	6
MacnRice2.tif	60	14	6
MacnRice3.tif	42	11	5