

# Assignment A7: Image Segmentation and Classification

*CS 6640*  
*Fall 2020*

**Assigned:** 5 November 2020

**Due:** 1 December 2020

1. Develop a gray level Bayesian classifier which provides  $P(\text{class} \mid \text{graylevel})$  at each pixel according to the header given below. Apply this to cleaning up the ground truth provided for map1 and discuss (qualitatively) how well it works.

```
function classes = CS6640_Bayes_1D_class(im,imc)
% CS6640_Bayes_1D_class - Bayesian gray level classifier
% On input:
%   im (MxN array): input image
%   imc (MxN array): classes image
% On output:
%   classes (MxN array): classified image
% Call:
%   classes1 = CS6640_Bayes_1D_class(map1g,map1_grount_truth);
% Author:
%   <Your name>
%   UU
%   Fall 2020
%
```

2. Develop a vector Bayesian classifier which provides  $P(\text{class} \mid \vec{v})$  at each pixel according to the header given below. Apply this to cleaning up the ground truth provided for map1 and discuss (qualitatively) how well it works.

```
function [classes,models] = CS6640_Bayes_nD_class(im,imc)
```

```
% CS6640_Bayes_nD_class - Bayesian vector classifier
% On input:
%     im (MxNxP array): input image
%     imc (MxN array): classes image
% On output:
%     classes (MxN array): classified image
%     models(vector struct): models info
%     (k).mu (Px1 vector): mean vector
%     (k).sigma2 (PxP array): covariance matrix
% Call:
%     [classes,models] = CS6640_Bayes_nD_class(map1,map1_grount_truth);
% Author:
%     <Your name>
%     UU
%     Fall 2020
%
```