## 160010031\_160010011\_160010 058\_assignmentSegmentation

by Krishna Wadhwani

**Submission date:** 03-Sep-2018 12:02AM (UTC+0800)

Submission ID: 995548757 File name: code.txt (3.88K)

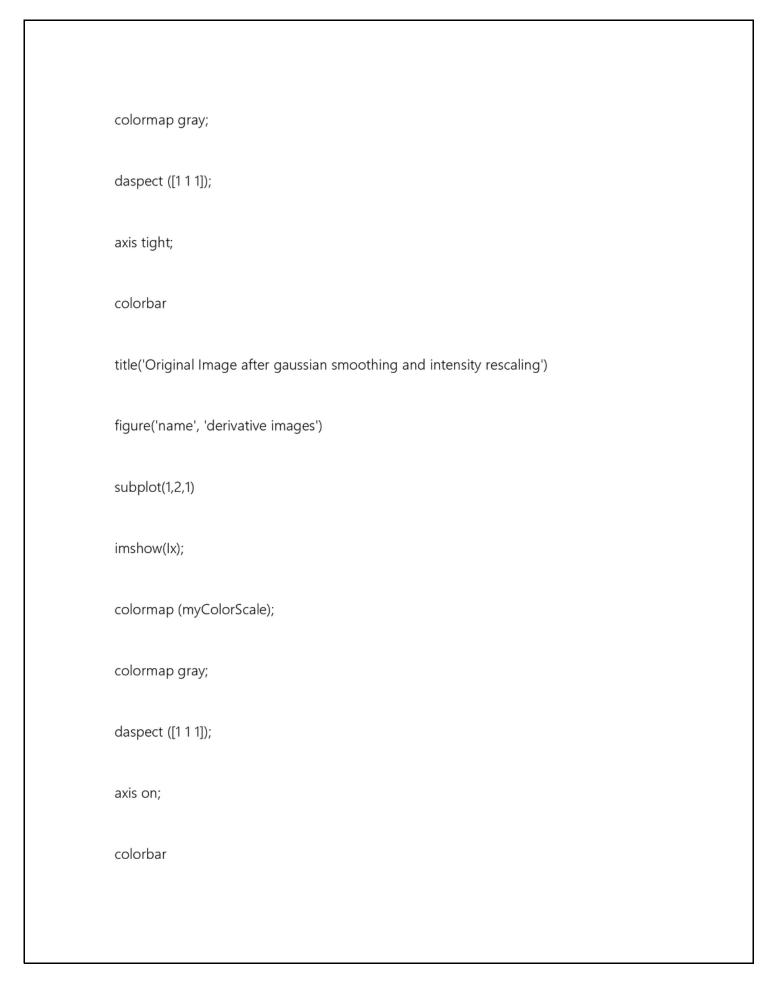
Word count: 428

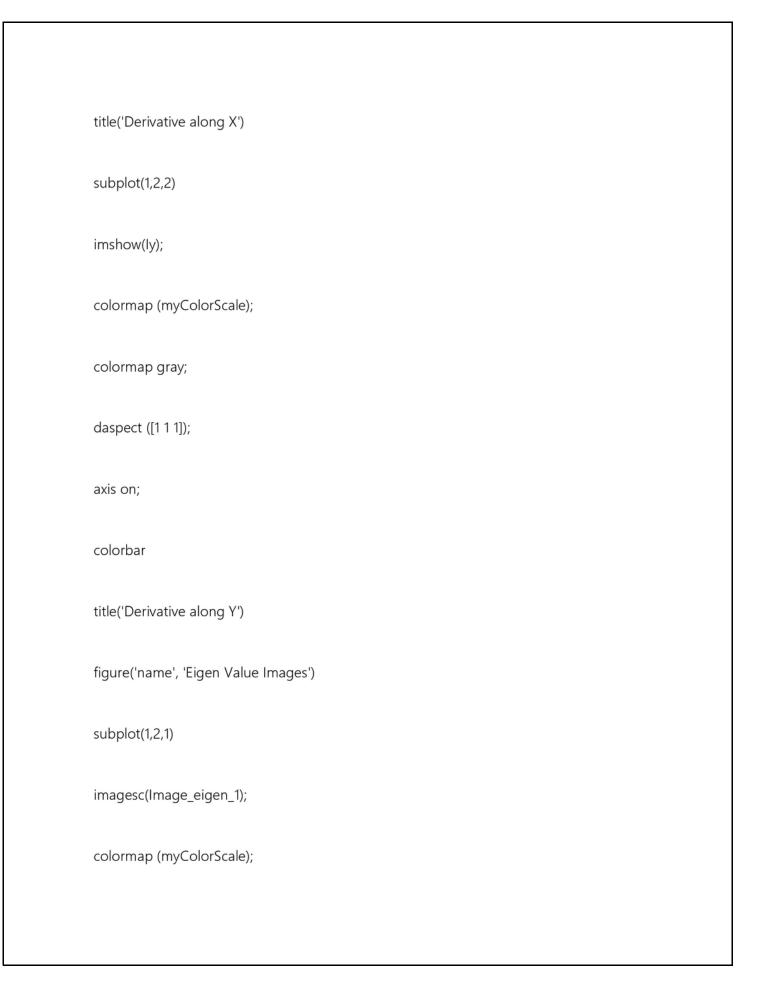
Character count: 3303

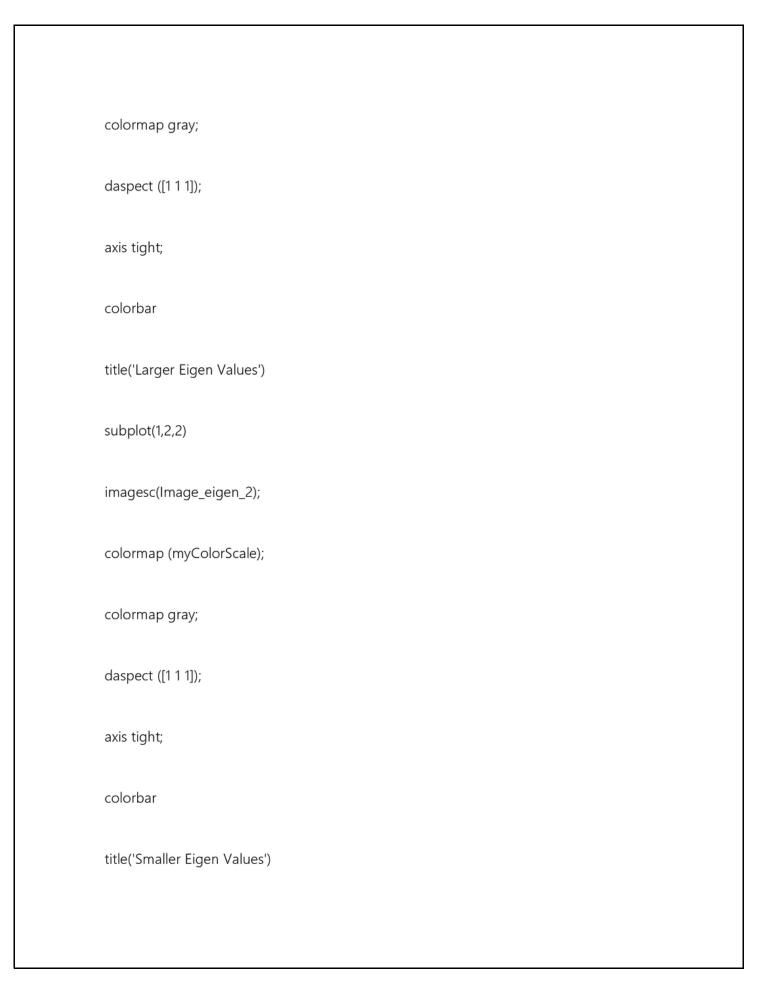
```
function myHarrisCornerDetector(input)
M = size(input,1);
N = size(input,2);
G = fspecial('gaussian', 5 , 1);
input = imfilter(input, G);
image = myLinearContrastStretching(input/255);
dx = [-1 \ 0 \ 1; -1 \ 0 \ 1; -1 \ 0 \ 1];
dy = dx';
Ix = imfilter(image, dx);
ly = imfilter(image, dy);
Image_eigen_1 = zeros(M,N);
Image_eigen_2 = zeros(M,N);
G = fspecial('gaussian', 8 , 1.5);
```

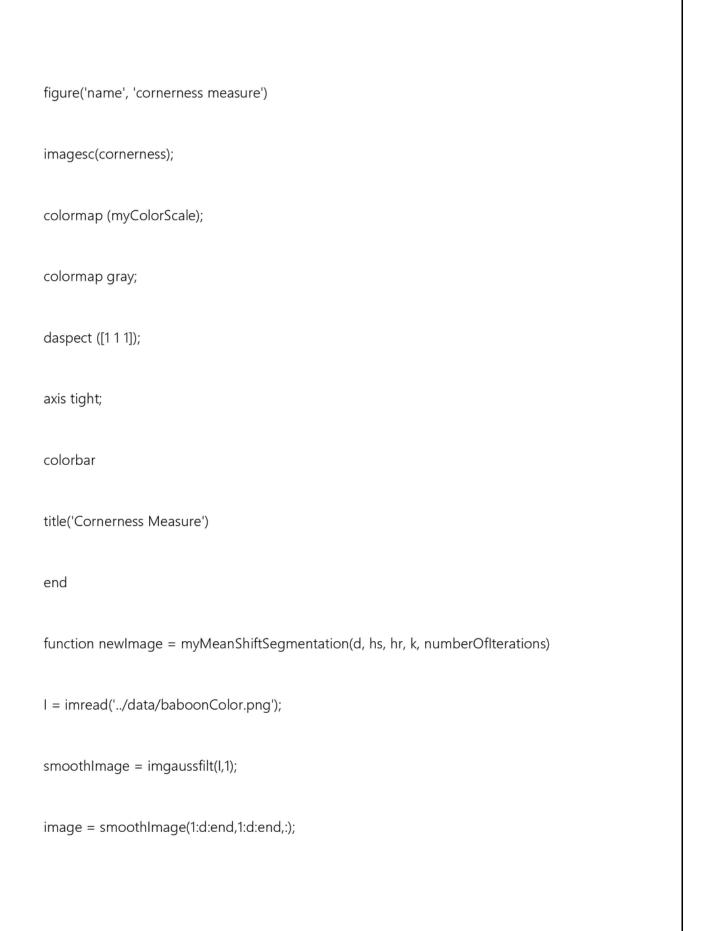
```
Ix2 = imfilter(Ix.*Ix, G);
ly2 = imfilter(ly.*ly, G);
lxy = imfilter(lx.*ly, G);
determinant_A = Ix2.*Iy2 - Ixy.*Ixy;
trace_A = Ix2 + Iy2;
k = 0.06;
threshold = 0.04;
cornerness_matrix = determinant_A - k*(trace_A.*trace_A);
cornerness = (cornerness_matrix>threshold)*255;
for i = 1:M
  for j = 1:N
     a11 = Ix2(i,j);
     a22 = Iy2(i,j);
```

```
a21 = lxy(i,j);
     A = [a11 \ a21; a21 \ a22];
     eigen_values = eig(A);
     Image_eigen_1(i,j) = max(eigen_values);
     Image_eigen_2(i,j) = min(eigen_values);
  end
end
myNumOfColors = 200;
myColorScale = [\ [0:1/(myNumOfColors-1):1]'\ ,\ [0:1/(myNumOfColors-1):1]'\ ,
[0:1/(myNumOfColors-1):1]'];
figure('name', 'Original Image after gaussian smoothing and intensity rescaling')
imagesc(image);
colormap (myColorScale);
```



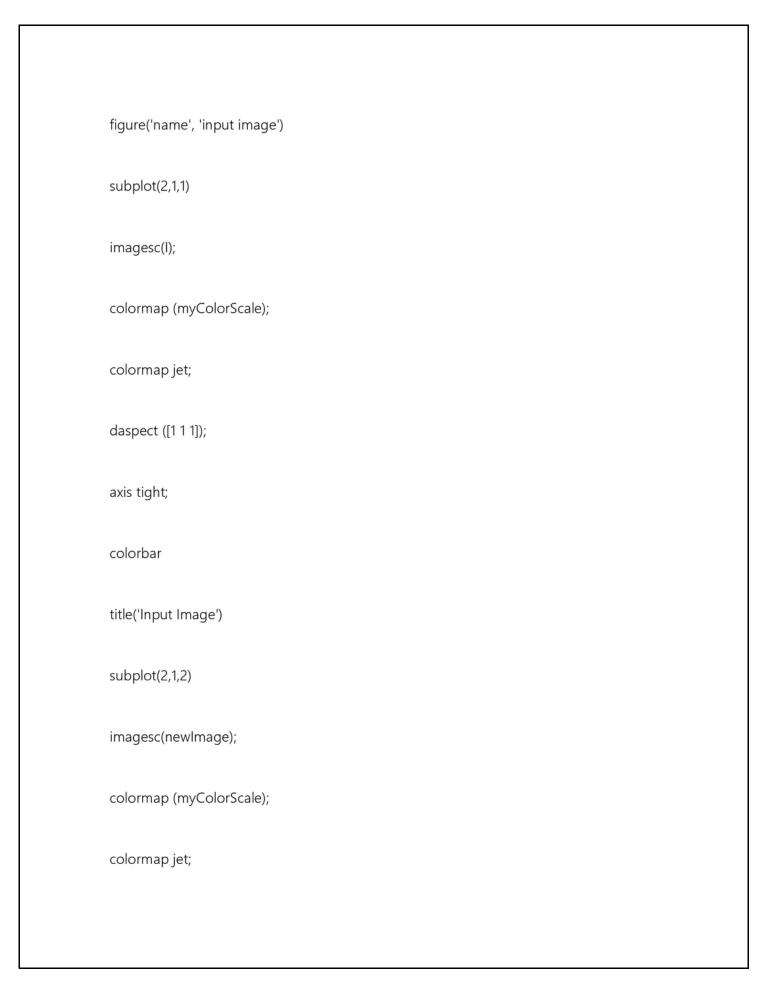






```
image = im2double(image);
[rows,cols,~] = size(image);
%constructing the 5D feature-space for points on the image
featureSpace = [];
for i=1:rows
  for j=1:cols
     pixel = image(i,j,:);
     featureSpace = [featureSpace; [i/rows, j/cols, pixel(1), pixel(2), pixel(3)]];
  end
end
featureSpace(:,1:2) = featureSpace(:,1:2) / (hs);
featureSpace(:,3:5) = featureSpace(:,3:5) / (hr);
newImage = ones(size(image));
```

```
for i=1:rows
  for j=1:cols
     pixel = image(i,j,:);
     featureSpaceVector = [i/rows, j/cols, pixel(1), pixel(2), pixel(3)];
     convergedFeatureVector = meanShiftProcedure(k, featureSpace,
featureSpaceVector, numberOfIterations);
     newImage(i,j,:) = convergedFeatureVector(3:5);
       disp(strcat(string(i) ,',', string(j)));
%
  end
end
myNumOfColors = 200;
myColorScale = [ [0:1/(myNumOfColors-1):1]', [0:1/(myNumOfColors-1):1]',
[0:1/(myNumOfColors-1):1]'];
```



```
daspect ([1 1 1]);
axis tight;
colorbar
title('Segmented Image')
end
function convergedFeatureVector = meanShiftProcedure(k, featureSpace,
featureSpaceVector, numberOfIterations)
  for i=1:numberOflterations
     [Xid, D] = knnsearch(featureSpace, featureSpaceVector, 'k', k);
     weights = exp(-times(D,D))';
     estimate = sum(times(featureSpace(Xid,:), weights)) / sum(weights);
     featureSpaceVector = estimate;
  end
```

convergedFeatureVector = estimate;
end

## 160010031\_160010011\_160010058\_assignmentSegmentation

PAGE 1
PAGE 2
PAGE 3
PAGE 4
PAGE 5
PAGE 6
PAGE 7
PAGE 8
PAGE 9
PAGE 10
PAGE 11
PAGE 12