

Assignment A6: Segmentation

CS 4640
Spring 2018

Assigned: 27 March 2018

Due: 12 April 2018

For this problem, handin Matlab .m files for the functions described by the headers below. Note that one of these is a driver which creates inputs for each function and runs the function on those inputs to obtain the output.

Some notes:

- Indent headers correctly (5 spaces indented lines)
- Do not exceed 72 characters per source line
- CS4640_A6_driver: should show that each function works

None of the functions should write to the interpreter, draw, etc.

```
function D = CS4640_Hough_model(im)
% CS4640_Hough_model - create a Hough shape model
% On input:
%     im (MxN array): binary image with shape
% On output:
%     D (kx2 array): Hough model (offsets to anchor point)
% Call:
%     S_model = CS4640_Hough_model(S_im);
% Author:
```

```
% <Your name>
% UU
% Spring 2018
%
```

```
function [H,H2] = CS4640_Hough_detect(im,D)
% CS4640_Hough_detect - detect a Hough shape model
% On input:
%   im (MxN array): binary image with shape
%   D (kx2 array): Hough offset model
% On output:
%   H (M1xN1 array): Hough accumulator array (note it is bigger
%   than MxN
%       since it has to allow for the largest offset
%   H2 (MxN array): part of accumulator overlapping with original
%   image
% Call:
%   [H,H2] = CS4640_Hough_detect(im,D);
% Author:
%   <Your name>
%   UU
%   Spring 2018
%
```

```
function [lines_im,lines] = CS4640_lines(im,mag_thresh,ori_thresh)
% CS4640_lines - produce straight line setgments for image
% On input:
%   im (MxN array): binary line image
%   mag_thresh (float): edge magnitude threshold
%   ori_thresh (float radians): max distance for similar
%   orientations
% On output:
%   lines_im (MxN array): image of lines (they are numbered)
%   lines (kx3 array): line segments
%       col 1: row value
%       col 2: col value
%       col 3: line index
% Call:
%   [line_im,lines1] = CS4640_lines(im,1.5,0.96);
```

```

% Author:
%     <Your name>
%     UU
%     Spring 2018
%

function segs = CS4640_kmeans(im,k)
% CS4640_kmeans - segment image using kmeans
%     im (MxNxP array): input image
%     k (int): number of clusters
% On putput:
%     segs (MxN array): segmented image
% Call:
%     s = CS4640_kmeans(v1,4);
% Author:
%     <Your name>
%     UU
%     Spring 2018
%

function CS4640_A6_driver
% CS4640_A6_driver - driver for A6 functions
% On input:
%     N/A
% On output:
%     N/A
% Call:
%     CS4640_A6_driver
% Author:
%     <Your name>
%     UU
%     Spring 2018
%
```