

METR4202 -- Robotics

Tutorial 7 – Week 7: Image formation and features

Reading

Review Matlab's documentation on the image processing toolbox

Try:

```
doc imread
doc imshow
doc rgb2gray
doc imtool
```

Questions

Pick two random numbers from 1-25. Given this to the group next to you. Using the random values given to you from the neighboring group, perform a Google Images search for a soda can (of a brand of your choosing). Take the N^{th} images based on the random number given.

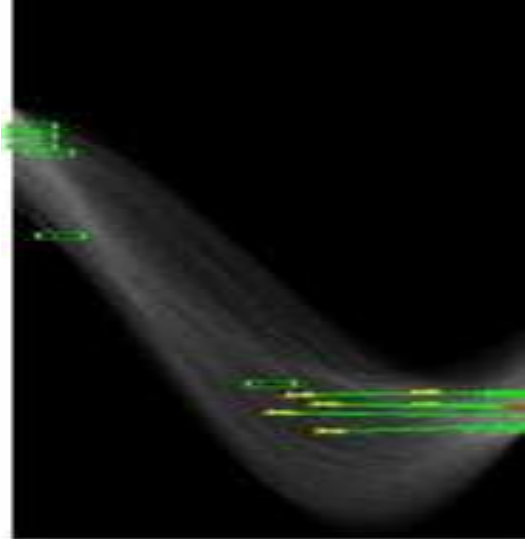
1. Load the provided picture (of a house) and the can images into Matlab, using the image toolbox.
(hint: try `doc imread`)



2. Perform a Canny edge detection on the newly loaded image (hint try `doc edge`). Try varying the T and sigma values to a better result. Your output should look something similar to below.



3. Perform a Hough transform on the canny edge results from part 2.
 - Try `doc hough`
 - Find a reasonable number of peaks in your Hough transform results using `houghpeaks`
 - Use these peaks with `houghlines` to produce a line plot of the original image.



4. Resize and rotate the image using the following code snippets
(This is illustrated in the “ipexrotate” example (`showdemo ipexrotate`))

```
I = imread('<filename here>');  
imshow(I);  
scale = ##;  
J = imresize(I,scale); % Try varying the scale factor  
theta = ##;  
K = imrotate(J,theta); % Try varying the angle, theta.  
figure, imshow(K)
```

Now explore using `cp2tform` to infer spatial transformation from control point pairs selected on the object (`doc cp2tform`)