

631 Computer Vision HW-03

You can talk with each other, but submit your own independent work.

Submit one file, HW03_<lastname>_<firstname>.zip which contains:

- A. Your program, named HW03_<lastname>_<firstname>.m
- B. Your writeup, named HW03_<lastname>_<firstname>.pdf or *.docx

1. Exploring Color Spaces: (5)

Write a function called HW02_<lastname>_Disp_Color_Spaces(fn). It takes in the filename of an image. Explore which color space works best for the following images. It should look at each of the following color planes separately:

- Red
 - Green
 - Blue
 - Hue
 - Saturation
 - Value
 - L (first channel of Lab)
 - a* (second channel of Lab)
 - b* (third channel of Lab)
 - Y
 - Cr
 - Cb
- Run the program on the following images and report which channel causes the highest absolute contrast.
 - Fill in the following table:

Image Name	Task to Perform	What was the Best Color Channel to use for the task? What contrast did you measure for that channel?
ANPR_IMG_2387.jpg	Telling the license plate from the car color.	
Macbeth_7457.jpg	Telling the red square from the black square.	
Michelle_Carter_first_us_shot_put_gold_winner_2016__credit_Alexander_Hassenstein_via_Getty_Images_2016.jpg	Detecting the name "CARTER" against the white background.	
TBK_Kite.jpg	Telling the red patch of the kite from the background sky.	
peppers.png (matlab image)	Detecting the yellow pepper from the other objects.	

2. Exploring Noise: (4)

You are issued five images of a graycard taken with different lighting conditions.

For each image:

- Read the image in, and convert it to a double file format.
- Display the image in RGB colorspace.
- Select a rectangular region near the center of the gray card rectangle.
- Convert the RGB region to grayscale using `im_grayscale = rgb2gray(im_rgb_in)`.
- Display an image histogram the the grayscale version using the following code

```
figure( 'Position', [40 5 1024 768] );  
imhist( im_grayscale, 256 );
```
- Compute some statistics for the rectangular regions of interest and fill in the following table:

Image Name	Average Value (3 digits)	Standard Deviation (3 digits)	Notes and Observations, if any.
GRAY_GC01_7334			
GRAY_GC02_7354			
GRAY_GC04_7370			
GRAY_GC04_7371			
GRAY_GC04_7372			
GRAY_GC10_20170208_104521			

3. Conclusions and Observations: (1)

Write up any notes you learned over-all on this assignment. Do you have any reflections about the importance of the color to use? Do you notice anything else when comparing images of graycards? Did the colors differ? Did the cameras keep them the same? Did you learn anything?

Provide evidence of learning...