

Assignment 3

Due: Tuesday 2/2 11:59 EST

1. Color Segmentation (50 pts) For this assignment you will modify the Connected-Component Labeling code that you wrote for Assignment 2 to be able to segment an image using color as your classifier. In `wk3Matlab.zip` you will find the 2 MATLAB m-files and 5 PNG images. First, `color_calib.m` provides a basic code structure that will help you with the color calibration procedure. You may write your own script/function to do the color calibration if you desire. If you do, please rename the function to `color_calib_user.m`. Next, `color_segment_user.m` provides a basic code structure to help you write your color segmentation code. Your code should go in the section indicated by the comment `YOUR CODE HERE`. Note that I have now turn `color_segment_user.m` into a MATLAB function with the area and centroid of the detected color blob(s) and a labeled output image as the output. This will enable you to call this function from the MATLAB command line or from any other m-file.

I suggest you begin with the image named `colorImage1.png` since this is the simplest image of all six. Segment out the red portions of the image. Once you have debugged your code and it is working, do the following the remaining images:

1. Pick a color in `colorImage2.png` and segment out the regions of the image of the chosen color.
2. Segment out the green peppers in `veggies.png`.
3. Segment out the red portions of the bird in `colorImage4.png`.

Once your code is working, pick your favorite image and try your code on it.

What to turn in: Submit your version of the `color_calib_user.m` if you decided to modify or write your own and `color_segment_user.m` where `user` is your Drexel login. I will run your code on a different image to see whether it works or not. In your write-up, make sure you include all the output images. Remember, your PDF files must be no larger than 5MBs.

Extra Credit 1 (10 pts): Can you find the Flash in `justice_league_user.png`? In order to get full credit you will need to submit your matlab code `flash_found.m`. The output image from your code must clearly identify the Flash in the image.

Extra Credit 2 (15 pts): Rather than a priori specify the color you are segmenting from the image, modify your code such that it automatically segments the image into regions that are “similar” in color. Also, the output of your code should be a list of centroids along with the associated mean and variance of the colors for the different regions. In order to get full credit, you will need to submit your matlab code `auto_color_segment_user.m`.