

## CSE152 – Introduction to Computer Vision – Homework 1

Instructor: Ben Ochoa

Due : Wednesday, April 11, 2018, 11:59 PM

### Instructions:

- Review the academic integrity and collaboration policies on the course website.
- This assignment must be completed individually.
- Submit a report on and the source code on Gradescope. The report must be in PDF format and the source code should be in .ipynb format. A report should describe the problems, your solutions, and results. The report must contain enough information for a reader to understand the problems and replicate your work without also having the assignment.
- Programming aspects of the assignments should be completed using only Python.
- No physical hand-in for this assignment.

## 1 Play with colors [3 Points]

Write a program that does the following:

- Read in a color image
- Resize the image to 256 x 256 pixels using bilinear interpolation
- Tile the image to form 4 quadrants where:
  - The top left quadrant is the original image
  - The top right is the green channel of the original image (other channels set to zero)
  - The bottom left is the red channel (other channels set to zero)
  - The bottom right is the blue channel (other channels set to zero)

Test your program with the given image rick.jpg. Expected output for this task is given in Figure 1. In your report, write a short paragraph explaining your results. Does your program produce the correct output?



Figure 1: Output for rick image

## 2 Image Rotation [2 Points]

Consider an image  $I$ . Write a function to rotate the  $I$  by  $\theta$  radians anticlockwise,  $\theta \in \{0, \frac{\pi}{2}, \pi, \frac{3\pi}{2}\}$ . Your function need not handle other angles. Do NOT use built-in rotation functions such as `warpAffine` in Python (OpenCV), or any other library function to rotate  $I$ . Include four images in the report:  $I$  and three rotated images like in Fig 2. You should run your function on the UCSDlogo.png image provided on the website and provide results only for that.



Figure 2: The four images