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CS 3150

Homework 1

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After importing the appropriate packages I wrote my self a quick helper method that I figured I would come in handy. Because I knew that I would be displaying the image often while working on it, I made a short method to make that a one-line operation instead of two.

Next I read in my image with cv2.imread function and saved it as ‘original’:

A screen shot of a person

Description automatically generated

Because the image was read in as BGR instead of RGB it is very blue and kind of sickly. To reverse this I used another cv2 method, cvtColor:

A close up of a person

Description automatically generated

That’s better. Next step, I used .shape to grab some dimensions, calculated the center of the width, and began to define my frame. I elected to create a rectangular frame but with a top edge in the shape of some mountains instead of a straight line. Python’s abs() came in handy here:

A person with collar shirt

Description automatically generated

I’m starting to like this but I want something more interesting for the background. I decided to have a fade from light brown to a color called Saddle Brown. There was a problem though:

A close up of a mans face

Description automatically generated

The range of my colors went a little out of bounds. I decided this would be ok because I planned to crop and center the image anyway.

To center the image and remove that jarring purple area I created an all new image array using numpy and the zeros method. From there I copied only the area I wanted from my old image to the new image. Here is my final product:

A picture containing sunglasses

Description automatically generated

Not bad. Maybe next time I’ll pick a picture that doesn’t make me look so grumpy.

For enhancement I tried both histogram equalization and Gamma transformation. To achieve the histogram equalization I made a histogram with of each red, green and blue intensity and included their corresponding cumulative density functions:

A close up of a map

Description automatically generated

I then proceeded to augment my image with the different CDFs, trying all sorts of combinations but ultimately all of them look a bit alien and not very good. Here is what it looked like with all three applied:

A person taking a selfie

Description automatically generated

I abandoned histograms for gamma transformation and had much better luck. I new that I might like this image just a little bit darker but only slightly. After playing around with a couple different values for gamma I settled on 2.2, here is the result:

A close up of sunglasses

Description automatically generated

Just a little darker than the first one but I think that does the trick.