E/16/134
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CO543 – Image Processing Lab05

RGB colour space

1. Read an RGB colour image and extract the three colour components into variables R, G, B
2. Save each variable as different RGB images
3. Concatenate the three variables again and save as a new image. Compare the original image with the new one

Input image

Output image

Custom transformation function

1. Read a colour image as RGB image
2. Convert the RGB components into YCbCr components using your own custom function. Use the JPEG conversion constants https://en.wikipedia.org/wiki/YCbCr

Input image

Output image from own function : YCbCr = rgb2ycbcr(I)

Output image using opencv function : I2 = cv2.cvtColor(I, cv2.COLOR_RGB2YCrCb)

The YCrCb Colour-Space1. Read a colour image as RGB image

1. Read a colour image as RGB image
2. Use rgb2ycbcr function to separate the image into Y, Cb and Cr
3. Use imresize to down-sample only the Cb and Cr components in each dimension by factor 1.5, 2, 4, 6 and 8
4. Use imresize to up-sample the down-sampled Cb and Cr components to their original sizes. The resultant matrix should exactly match the original dimension.
5. Combine Y and these two new components. Transform back to RGB colour coordinate by ycbcr2rgb. Save the image and observe the difference with the original image.

Input image

Output Images after the process
For factor 1.5

For factor 2

For factor 4

For factor 6

For factor 8

It can be seen that checker board effect is increased from factor 1.5 to 6 and in the factor 8 again smooth image is obtained. The colour of the car more close to orange than red.

Colour spaces for segmentation

- Step 1: Get the colour values for a particular colour

Ex:- Find the approximate range of values of green colour for each colour space.

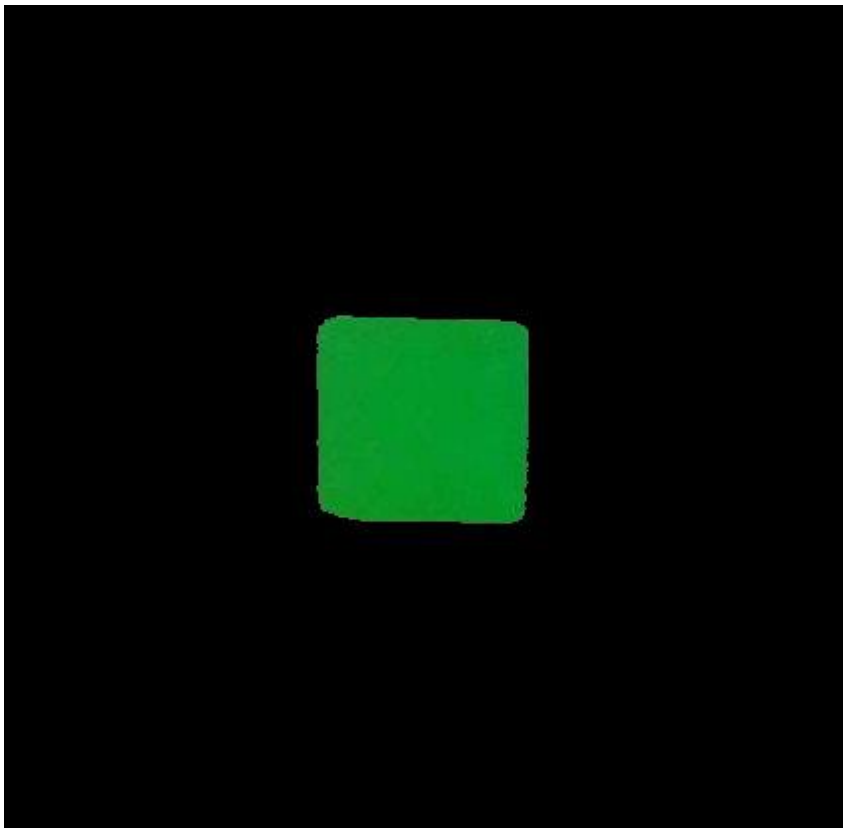
- Step 2: Applying the threshold for segmentation

Ex:- Extract all pixels from the image which have values close to that of the green pixel.
Use the OpenCV function inRange for finding the mask of green pixels and then use bitwise_and operation to get the green pixels from the image using the mask.
Also note that for converting one pixel to another colour space, first need to convert 1D
array to a 3D array.

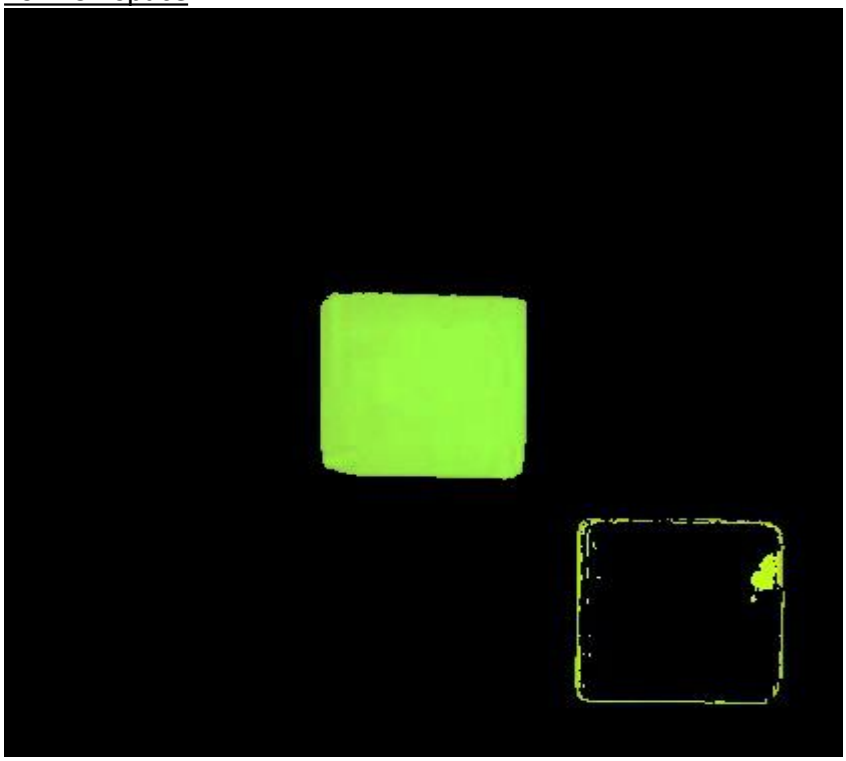
Input image

Output images

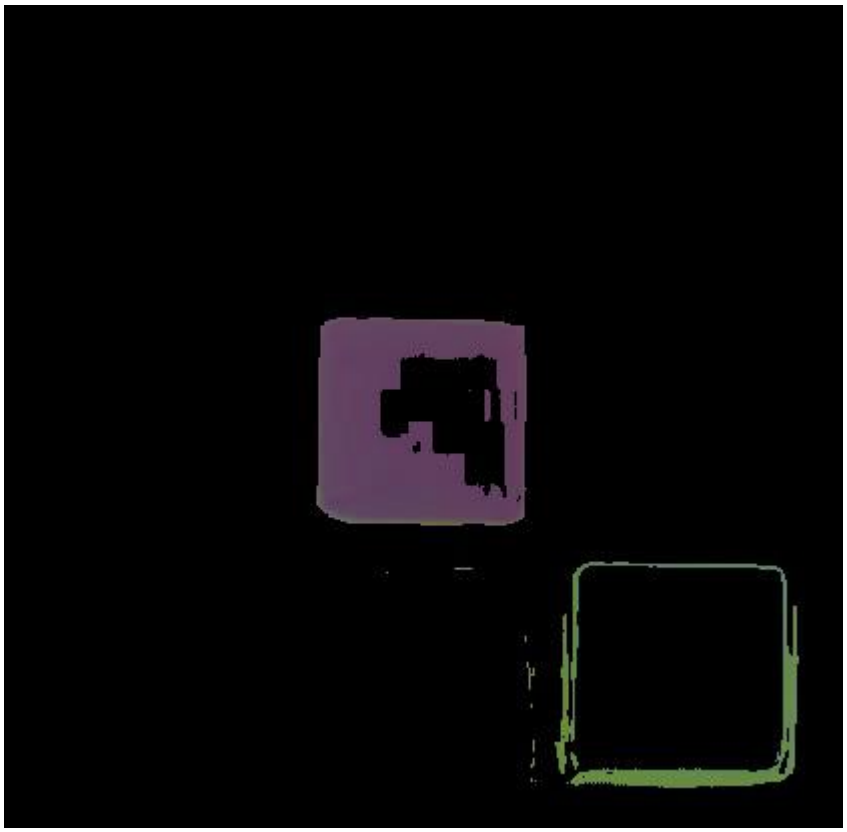
For BGR space



For HSV space



For YCrCb space



For LAB space