**PRAKTIKUM 8**

**Color Image Processing 2**

**SISTEM PENGOLAHAN CITRA**

**PROGRAM STUDI SISTEM KOMPUTER**

**SCHOOL OF INFORMATION SCIENCE AND TECHNOLOGY**

**UNIVERSITAS PELITA HARAPAN**

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**Part 1 – RGB Filtering**

1. Read the image **lena512color.tiff** into MATLAB/Octave using imread.
2. Create three new matrices R,G, and B containing the Red, Green, and Blue components of Lena.
3. Use **subplot(2,2,n)** and **imshow** to plot the original image and each of the three RGB components, where n=1,2,3,4. Place a title on each image using **title** command, and *put this image in your lab report*.
4. Set the red components of Lena to **zero**, and **halve** all the green components of Lena.
5. Recombine the modified RGB components from part 4 to create a new color image of Lena.
6. Create a new **subplot(2,2,n)** and **imshow** to plot the modified RGB components and the combined image, where n=1,2,3,4. Place a title on each image using **title** command, and *put this image in your lab report*.
7. Comment about the result of the RGB filter processing in your lab report. Where and how can this kind of processing be used?

**Part 2 – YCbCr Filtering**

1. Load the file **ycbcr.mat** into MATLAB/Octave by downloading it into your matlab/octave folder folder and call the **load** **ycbcr.mat** function from MATLAB/Octave (same file as previous lab).
2. Create three new matrices Y,Cb, and Cr containing the luminance (Y) and two chrominance (CbCr) components of ycbcr.mat.
3. Use the **h** matrix from ycbcr.mat to filter the **luminance (Y)** component using the **filter2** function. h is a 5x5 gaussian lowpass filter with σ = 2.0.
4. Convert the filtered Y and Cb & Cr values into RGB using function from lab 7.
5. Recombine the RGB components into a color image.
6. Use **subplot(2,2,n)** and **imshow** to plot three RGB components and their combined image, where n=1,2,3,4. Place a title on each image using **title** command, and *put this image in your lab report*.
7. Repeat parts 3 to 6, but this time filter the two **chrominance** components (**Cb** and **Cr**) using **h** matrix and **filter2** function. *Put the images in your lab report*.
8. Comment on the difference of the result from part 6 and 7 in your lab report. What conclusion can be drawn from those results?

References:

* <https://www.gnu.org/software/octave/>
* GNU Octave Manual
* Class Materials, Slide Week 10 & 11
* Purdue ECE 438 Lab 10a: <https://engineering.purdue.edu/VISE/ee438L/lab10/pdf/lab10a.pdf>