MIDDLE EAST TECHNICAL UNIVERSITY
NORTHERN CYPRUS CAMPUS

CNG 483 – INTRODUCTION TO COMPUTER VISION
SPRING 2019-2020

Assignment 1 – Hand segmentation using skin color model

Deadline: 05/04/2020 23:55

Policy: You can use any programming language for the implementation. Upload your code (only one txt file) to ODTUClass. Your txt file name should be your student number. Late submissions will not be accepted and graded as zero.

Objectives: A typical Automatic Sign Language Recognition System (ASLRS) requires the implementation of a complete processing chain encompassing hand segmentation, feature encoding and the recognition steps. Hence, main objective of this assignment is to implement the first stage of ASLRS by using a skin color model.

Description: In this assignment, you need to implement a software to segment the hand region in the given images. Hand images are provided to you in the folder "Dataset". Your software should do step by step following tasks;

1. [5 pts.] Read each image in the Dataset.
2. [20 pts.] Apply Grey world algorithm to each image in order to remove illumunation effects.
3. [25 pts.] Analyse R, G and B channel of transformed image (hint: may be you can use histogram for this purpose) and try to find threshold value(s) to seperate the skin color of the hand and the background.
4. [10 pts.] Apply the threshold(s) to the image to obtain segmented hand region (image with hand region set to white and background set to black).
5. [30 pts.] Go back to Step 3. Now first convert the image to YCbCr color space and repeat steps 3 and 4.
6. [5 pts.] Which color space gives better skin segmentation results, RGB or YCbCr?

[5 pts. Good programming (comments)]

Example segmentation of hand:

Here I draw the red contour for the hand. You can try to do that too! Hint: use the segmented image (binary image, see step4) information.