



**Practice of the third series**  
**Computer vision basics course**

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**Delivery deadline: May 9**

versa. (and the CMYK scale is 1. A) Convert the color [130, 70, 50] from the RGB color space to the CMYK color space and vice percentage. **Note:** b) RGB scale 255 by using ready-made functions of photo jpg1 into 2 YCbCr color space c) jpg1 photo as separate V, S, H channels. (5 points) d) Using a method similar to the one Cut and display HSV. (5 points) mentioned in the class, find the differences between the two pictures png2 and png3. (5 points)

we do? (5 marks) (e) Why use several color spaces

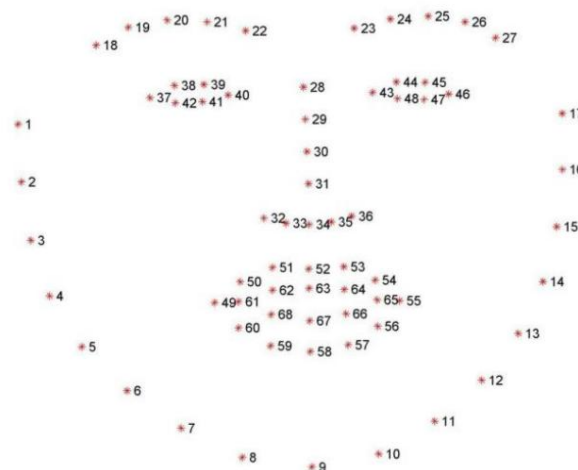
2. One of the applications of image adaptation is the creation of panoramic images. Write a program that the photos in the file 2Q Connect the images together. For this purpose, complete notebook 2Q . (10 points)  
(You can use the [functions](#) of this link to create panoramic images.)

3. A) One of the ways to describe the face is to use landmarks, which define specific points of the face.  
With the help of landmarks and image matching, place the jpg.mask image on the face of the jpg.face photo.  
To work with landmarks, [you can use the dlib library](#) . For more information , refer to this link. ) 15


Score(

The face key points detector is used inside the dlib library to estimate the position of 68 coordinates (x, y ) which is

The face below is mapped to the key points of the face.



Choose 4 of these points (for example, 4 points including the nose, chin, left and right part of the face) to find the transformation of the mask.  
do .

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Find 4 points corresponding to those points in the mask image.

Then, the previous 4-point transformation

display the result.

function and finally, using the obtained transformation, put the mask image on the face image and

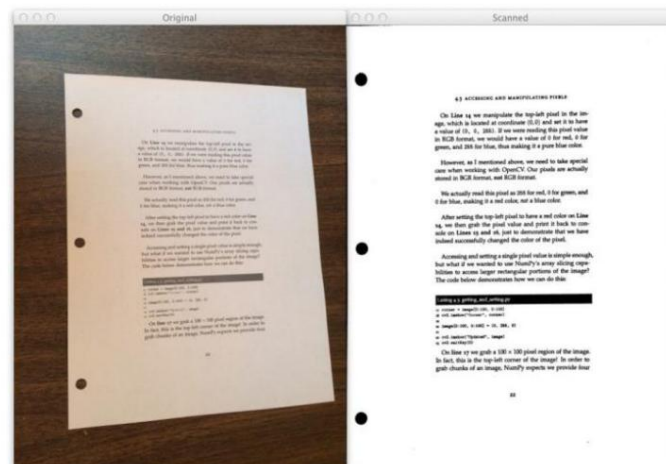
**Points:** b) Explain about the landmark face detection task in computer vision and one of the available solutions.

(5 points)

4. Take a white paper and write your name and student number clearly along with a text, and then from the paper

Take a photo so that the surrounding paper is clear in the photo. (like the picture on the left)

We are going to go from an image like the one on the left to an image like the one on the right.



A) Convert the photo to grayscale using OpenCV and then make noise and then use a suitable edge detector.

(like canny ) find edges. Explain the reason for your choice and the parameters used. (5 points)


b) Find the paper using the findContours function and specify the border of the paper in the image. (5 points)

c) After doing part b, add the additional background image using functions related to Transform Perspective of the image

delete (15 points)

The reason for it is **points:** d) With the things you have learned so far, provide some methods to improve the quality of the paper image and

also say Then implement one of these methods to your liking. (10 points)

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5. A) Explain the steps of the harris algorithm completely. (5 marks) b) In the 5Q notebook , you must first implement the harris corner finder algorithm . Then use it to find the corners of the jpg.harris image. In the next step Using OpenCV ready functions for harris corner finder, corners

Find the same image and compare the two results. (10 points)

ORB has studied this link to extract the key points and the extracts from

6. Regarding the 3 SIFT, SURF methods

Provide a comparison of these 3 methods. (10 points)

**Please read the document on the rules for conducting and delivering lesson exercises and comply with the requested items.**

**Good luck.**