CENG 391 Introduction to Image Understanding

October 13, 2016

Basic Data Types & UI with OpenCV

Exercise 1 (*Basic Data Types*): Write a C++/Python program that takes an argument as the name of an image and operates the following tasks.

1. Read the image ("graffiti.ppm")
2. Draw shapes on the image listed in the below:
   - One **red** line from the coordinate $(10, 10)$ to $(520, 260)$
     Hint: You can use **"line"** method to draw line on the image.
   - One **green** rectangle with the corner coordinates $(50, 50)$ and $(300, 150)$
     Hint: You can use **"rectangle"** method to draw rectangle on the image.
   - Two **blue** points on the coordinates $(10, 10)$ and $(50, 70)$
     Hint: You can use **"circle"** method to draw circle on the image.
   - Write "CENG 391" as a text colored with **magenta** whose left bottom coordinate is $(400, 400)$
     Hint: You can use **"putText"** method to draw a text string on the image.
3. Show the image
4. Write the image as "modified_img.ppm"

Exercise 2 (*High-level GUI*):

Exercise 2.1 (*Adjusting Brightness and Contrast*): Write a **C++** program that takes an argument as the name of an image and operates the following tasks.

1. Read the image. ("graffiti.ppm")
2. Create a window to show the image.
3. Create a trackbar on the window to change brightness of the image.
4. Create a trackbar on the window to change contrast of the image.
   Hint: You can use **"createTrackbar"** method to add a Trackbar to your application.
   Hint: In order to modify image with given brightness and contrast values you can use **"convertTo"** method.
5. Change the brightness and contrast of the image on the window until user interruption occurs.
   Hint: You can use **"waitKey"** method to handle user interruptions.

Exercise 2.2 (*Image Blending*): Write a **Python** program that takes two arguments as the name of images and operates the following tasks.

1. Read the images. ("LinuxLogo.jpg", "WindowsLogo.jpg")
2. Create a window to show their blended image.
3. Create a trackbar on the window to change weight of blending.
   Hint: You can use **"createTrackbar"** method to add a Trackbar to your application.
   Hint: You can use **"getTrackbarPos"** to get the current value of the item on the trackbar.
4. Change the weight of them on the window until user interruption occurs.
   Hint: In order to blend images with different weights you can use **"addWeighted"** method.
   Hint: You can use **"waitKey"** method to handle user interruptions.