Exercises

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Basics of openCV

1. Display “Lena.png” using openCV as
   - A color image (set the name of window as “lena_color”)
   - A gray-scale image (set the name of window as “lena_gray”)
2. Display “Background.mp4” video

3. Display “Background.mp4” video two times faster/slower
   - Set the name of window “faster”, “slower”

4. Declare a 3-channel matrix whose size is FHD
   - Set all pixel values as R=255, G=255, B=0

Mat operator

1. Display Saturation channel of Lena.png
2. Find the width, height of Sun.jpg. Set left-top region as a ROI of the image and display both the original image and the ROI
   - The shape of the ROI is rectangle, and the left-top position of the ROI is (50,50) and the right-bottom position is (400,200)
   - Set the name of window for the original image as “original”, the name of window for the ROI as “ROI”
   - Set all the pixel value of ROI as (R=0, G=255, B=255), and check what happens in the original image
3. Apply convertScaleAbs to “Night.mp4” video. Set alpha and beta as 5 and 10, respectively.

Mat operator

1. Perform subtraction and absdiff between Apple.jpg and lena.png and see the differences
    - Subtract lena.png from Apple.jpg
2. Try to add Apple.jpg and Fracture_spine.png. If error occurs, check the error message.
3. Perform various thresholding on Lena.png
    - Read the image as grayscale image
    - Set threshold as 128 and maximum value as 200
    - What happens when the image is read a color image?
4. Perform adaptive thresholding on Lena.png by setting maximum value as 200, constant value as 10
    - Read the image as grayscale image
    - Check the result depending on the block size
5. By using InRange function, try to extract apple region from apple.jpg

Drawing Function

1. Draw a green rectangle(R=0, G=255, B=0) on the face of "lena" in lena.png
2. Draw one trapezoid and one hexagon in one image by using fillPoly function only once
   - Generate an image whose size is VGA and initialize the color of each pixel as yellow. Set the color of trapezoid as black, and the color of hexagon as white

3. Draw two lines on road.mp4. Two lines should start from the top of the image and end at the bottom of the image
4. Display NTH3.mp4 with the information of current frame and total frame
   - The format should be "#of current frame/#of total frame
   - Text color should be red
   - The location of text should start (50,50)

Memory management/Pixel access

1. Read lena.png and convert all pixels values at even row to B=0, G=0, R=255 by using
   - at operator
   - data member function

2. Read lena.png and convert B values of all pixels to 255 by using MatIterator

3. Read Lena.png as a gray-scale image and check the pixel values at (x:100,y:120)