Aum Amriteshwaryai Namah

19AIE303 - Signal and Image Processing

Assignment 3

1. Basic Transformations:
    a) **Rotate** the image by 30 degrees. Avoid cropping of the sides
    b) Scale the image up by a factor of 2.5 in both x and y directions. Perform this operation with the three common interpolation techniques: **Nearest Neighbour, Bilinear Interpolation, Bicubic Interpolation**
    c) **Translate** the image to the right by 1/4th of the width and down by half the height

    Save the resulting transformed images in each case.

    Input image: calvinHobbes.jpeg

2. Rotate the given image by 45 degrees. **Follow the rotation by scaling** up by a factor of 10. Perform this combination of steps with the three common interpolation techniques: Nearest Neighbour, Bilinear Interpolation, Bicubic Interpolation. Save the resulting image in the three cases and observe the effect of each of the interpolation techniques.

    Input image: block.png

3. Perform the following for the given image.
    a) Eight successive rotation by 45 degrees
    b) Four successive rotation by 90 degrees

Compare the quality of the resulting image from both the above cases. Comment on your observations.

    Input image: 8.jpg

4. A distorted image is given. Performing an appropriate perspective transform will correct the image.
Distorted image: chDistorted.jpeg
Target correct view: ch.jpeg

Write a program to perform the perspective transform on the distorted image to change it to match the correct view

5.

Path Length

Find the shortest 4-, 8-, *m-path* between *p* and *q* for *V*= {0, 1} and *V*={1, 2}

			(q)
3	1	2	1
2	2	0	2
1	2	1	1
1	0	1	2
(p)			

Output to be submitted: Q1-4:

a) A Single python file with all questions and its parts
b) Resulting images from all parts of each question.
c) Include in comments the observation on different interpolation techniques in q1 and 2; and the quality of images in q3.

Q5. Snapshot of the answer
The images and the q5 answer can be added in one document and submitted

Pls avoid submitting .zip, .tar.gz formats etc

Links you can refer to:
https://docs.opencv.org/master/da/d54/group__imgproc__transform.html#ga5bb5a1fea74ea38e1a5445ca803ff121

https://opencv24-python-tutorials.readthedocs.io/en/latest/py_tutorials/py_imgproc/py_geometric_transformations/py_geometric_transformations.html

Rotate without cropping (for Q1):
https://stackoverflow.com/questions/43892506/opencv-python-rotate-image-without-cropping-sides/47248339