Assignment 1

Due Date Nov 20, 2021

In this assignment, you are required to write a program to deform a gray-scale image. The program should be in Python or C++ and based on OpenCV. It is expected to perform the following:

1. Loads and displays an image I.
2. Allows the user to place a work rectangle, with a medial vertical line, on the image.
3. Provides a mechanism to place and draw the work rectangle.
4. Allow the user to bend the medial line (left or right) parabolically around the middle of the line
5. Once the user is happy with the new shape of the medial line he executed the deformation procedure, which deforms the image by smoothly stretching one side and squeezing the other side. The pixels along the medial line will remain on the line (after the bending).
6. The output image should be smooth within the deformed area and on the boundaries
7. Your program is expected to support image quality (interpolation) at three levels: **nearest neighbor, bilinear interpolation, or cubic**.
8. At each execution of the deformation, your application should show the three output images

You need to design your assignment as two components, one will accept the input from the user and the second will pass this input to the deformation function which has the following format.

Mat deform(Mat img, Rect rect, float delta);

img: the input image, which could be passed as an argument to the command line
rect: the deformation region
delta: is the translation ratio (-1.0,1.0), where negative and positive indicate left and right translation, respectively.

Note:

1. User arc from circle or ellipse to illustrate the line bend
2. You can't use the interpolation function of OpenCV


Work Area
Medial