

Assignment 2

Due 3/02/2021

The objective of this assignment is for you to become familiar with the basic image operations. Select your choice of image processing environment: MATLAB or OpenCV.

1. Medial Axis (33.3%)

Use the two provided images to calculate their skeleton. Use the grassfire transform to calculate the points that are equidistant from the boundaries. Discuss the robustness to noise.

2. Two Image Operations (33.3%)

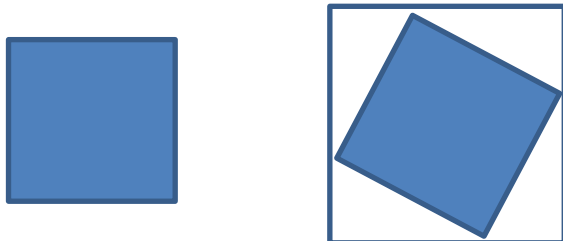
Select two images and perform addition and subtraction for a specific task (as discussed in class). Motivate the choice of images and the operation. Experiment with adding a smaller image (embedded into an image of the same size) into a bigger image. Discuss your choice of images and operations in the report.

3. Image Transformations (33.3%)

Take a sample image and apply the following transformations:

- Translation by dx, dy
- Rotation by an angle θ

In all cases first consider the new coordinates of the four corners, then create a new image that will fit the transformed image. Fill the empty pixels first with the average color of the original image. Finally, transform each pixel of the original image into the new image.



4. Image Multiplication (Grad Credit)

Multiply two images (pixel wise). As in Q2 motivate the selection. Experiment with operating only on one color channel. Discuss your choice of images and operations in the report. From Question 3 implement:

- Vertical shear

What to Submit

Please together with your code provide a report discussing your implementation together with some illustrative examples (screen shots – of the images used and the resulting images). The report will be the primary product of this assignment. Ensure that is well written and formatted. Document your work in images and use captions to describe what each image displays. Use of LaTeX is encouraged.

