PROJECT-1

Project submission

Due data

: 5. 2 (Sun) 21:00

How to submit

: Use LMS board

Submission

: Main report + source code

: The report document should be converted to the pdf file

: All source code files are zipped into one zip file

: Your submission → report.pdf, code.zip

Penalty

: Late submission

→ -5pt for every 1 hour after 21:00

→ -20pt per day (5 days late submission → no points)

: Plagiarism (e.g. copying someone else's report, source code, etc.) → No points

No exception

: No exception for network, system problems

: Email me if LMS system is not working (byungoh@kau.ac.kr)

: Please check the uploaded files again by downloading and uncompressing

1. (Image denoising) Please implement the followings and analyze the results.

   1) Generate the following noises, and add them to the ground-truth images.

      a) Impulse noise b) Gaussian noise

   2) Compute PSNR between ground-truth and noisy image.

      (Use the various noise energy by noise scaling.)

   3) Implement the following denoising filters, and apply them for denoising.

      a) Gaussian filter b) Bilateral filter

   4) Please compare and analyze the results with subjective and objective (PSNR) measurements.

2. (Image Restoration) Design a system to remove the text of the image.

1) Detect the text in given images, and decompose them to the text and image.

2) Fill out the blank to make the image visually attractive.

3) Please compute the PSNR of restored image.

3. (Image Transformation) Implement the followings and analyze and compare the results.

1) Transform the image with arbitrary angle and scale.

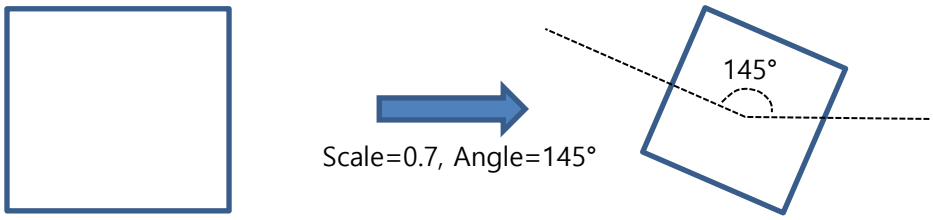
(Note that the image should be rotated with its center point)

e.g. Scale = 1.5, Angle = 30°

e.g. Scale = 0.7, Angle = 145°

2) Use the nearest neighborhood (NN) and bilinear method for interpolation.

3) Compare the interpolation results.



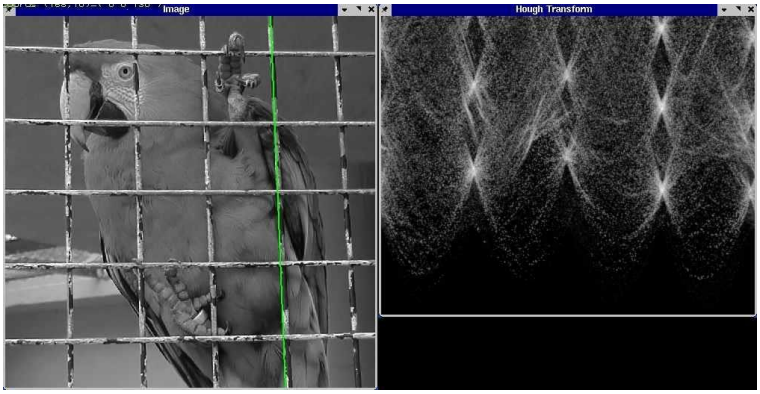
4. (Hough Transform) Please implement the followings and analyze the results.

   1) Find the edge map using Sobel mask.

   2) From binary edge map, apply the Hough transform.

   3) Analyze the result in Hough domain, and find the major lines.

   4) Draw the lines on top of the image as below.



Tip

1. DO NOT use the OpenCV library functions. (filter, conv, imnoise, …)

   Simple basic functions are allowed to use. (e.g., sin, cos, rand, randn, min, max, median, …)

   → It is highly recommended to use the library functions for comparisons.

2. Apply various options as much as possible. (e.g., varying noise energy, filter parameters, …)