

Computer Vision (CSE 6239), January Semester, 2018, KUET

Programming Assignment # 1

1. Write a function that convolves an image with a given convolution filter

function [output_Image]= myImageFilter(Input_image, filter)

Your function should output image of the same size as that of input Image (use padding). Test your function (on attached images House1.jpg and House2.jpg) and show results on the following Kernels.

- i. Averaging Kernel (3×3 and 5×5)
 - ii. Gaussian Kernel ($\sigma = 1, 2, 3$). Use $(2\sigma + 1) \times (2\sigma + 1)$ as size of Kernel (You may write a separate function to generate Gaussian Kernels for different values of σ .)
 - iii. Sobel Edge Operators.
 - iv. Prewitt Edge Operators.
2. Attached 'Noisy image1' and 'Noisy image2' are corrupted by salt and paper noise. Apply 5 by 5 Averaging and Median filter and show your outputs.
 3. Compute gradient magnitude for attached image 'Q3_Image'; use your own function.
 - i. Stretch the resulting magnitude (between 0 to 255) for better visualization
 - ii. Compute and show the histogram of gradient magnitude
 - iii. Compute gradient orientation
 - iv. Compute and show histogram of gradient orientation (angle between 0 and 2π)
 4. Load *walk_1.jpg* and *walk_2.jpg* images in openCV. Convert them to gray scale and subtract *walk_2.jpg* from *walk_1.jpg*. What is the result? Why?

Deliverables:

1. Report including Input and Output images (Soft Copy)
2. Code (Soft copy).

Submission Deadline: 29/03/2018