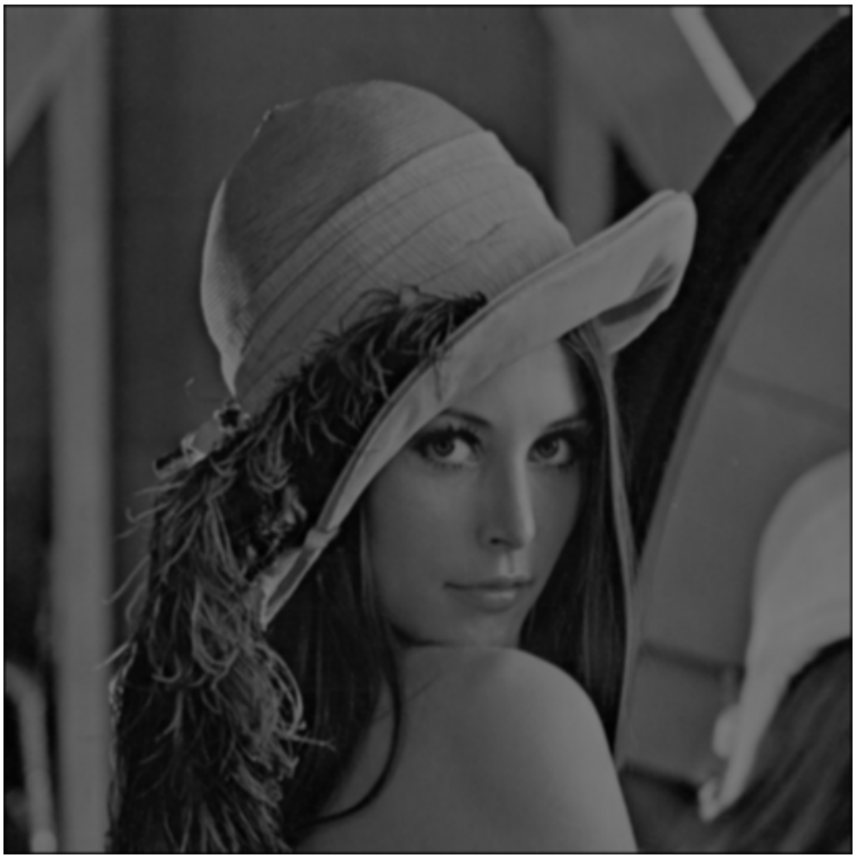
Table of Contents

PROBLEM 1

The amount of blur in the case with width 11 and sigma 3 is more. The results shows better effect on picture with more noise. Below are all the images with both the pair of width and sigma. The solution of this problem is in the folder "Problem 1". gaussian_kernel.m is the function to calculate the gaussian kernel which returns 2D array. problem_1.m is the function to check this function on all the images.

gaussian kernel with width 3 and sigma 1 on "lena.bmp"



gaussian kernel with width 11 and sigma 3 on "lena.bmp"

gaussian kernel with width 3 and sigma 1 on "lenaNoise.bmp"

gaussian kernel with width 11 and sigma 3 on "lenaNoise.bmp"

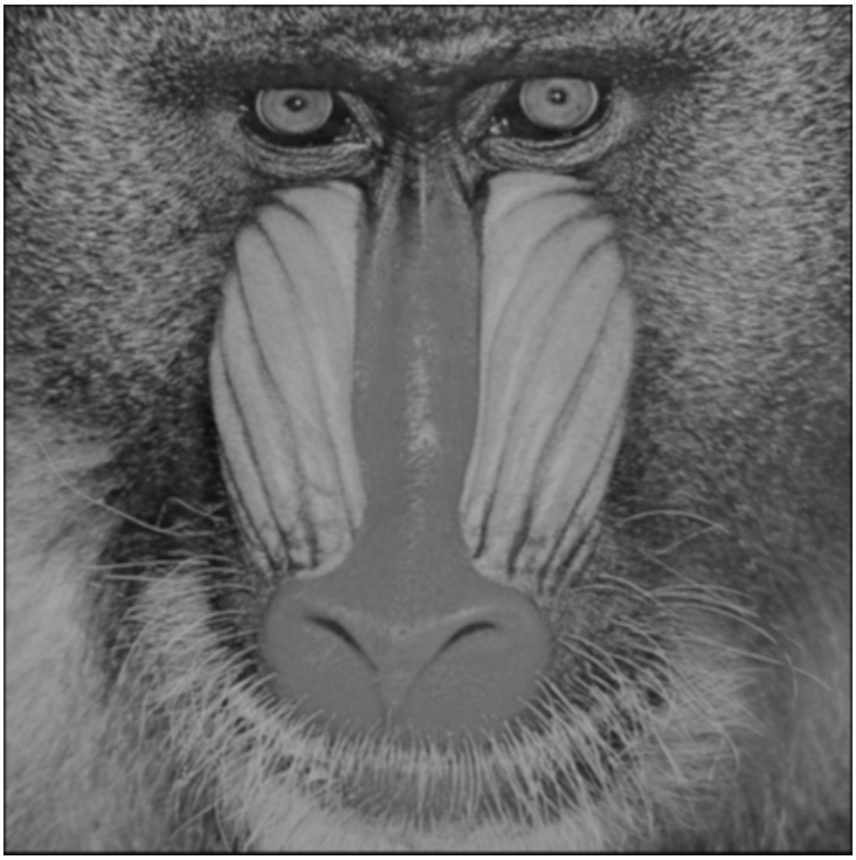
gaussian kernel with width 3 and sigma 1 on "barbara.bmp"

gaussian kernel with width 11 and sigma 3 on "barbara.bmp"

gaussian kernel with width 3 and sigma 1 on "barbaraNoise.bmp"

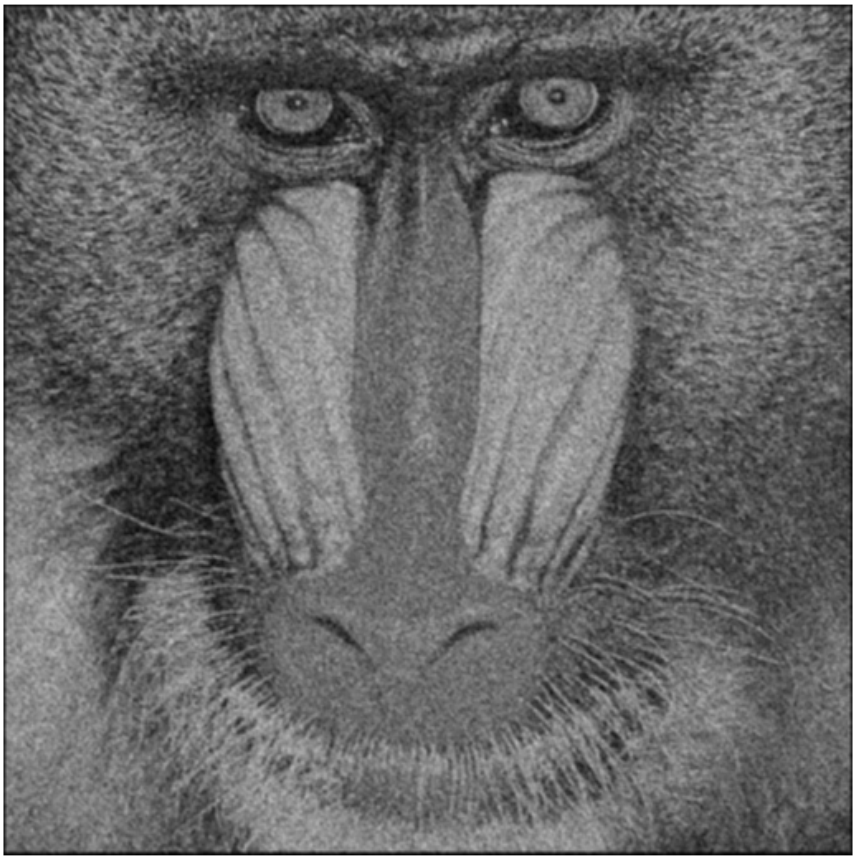
gaussian kernel with width 11 and sigma 3 on "barbaraNoise.bmp"

gaussian kernel with width 3 and sigma 1 on "mandrill.bmp"



gaussian kernel with width 11 and sigma 3 on "mandrill.bmp"

gaussian kernel with width 3 and sigma 1 on "mandrillNoise.bmp"



gaussian kernel with width 11 and sigma 3 on "mandrillNoise.bmp"

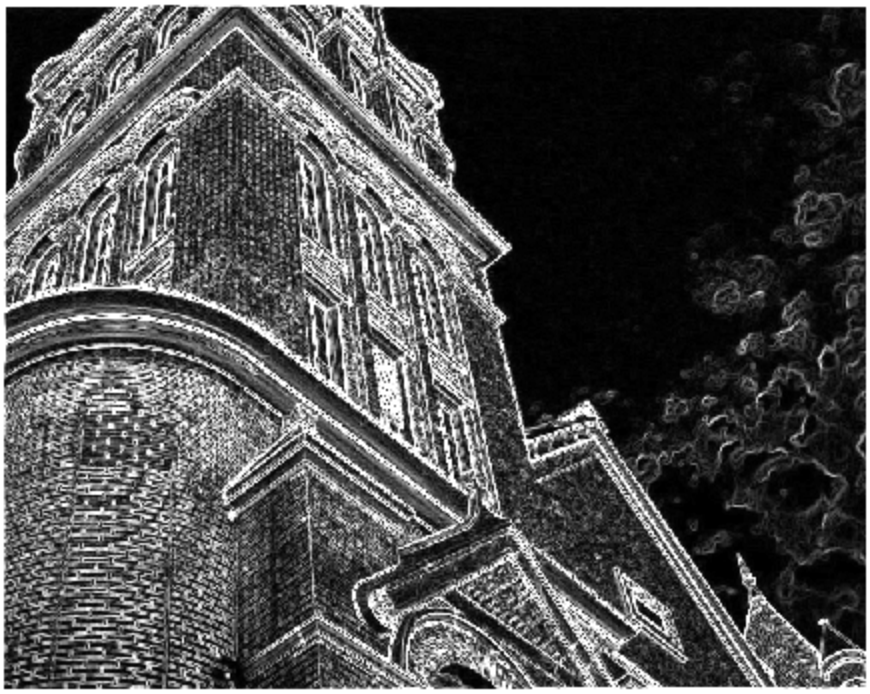
PROBLEM 2

The Matlab code for this exercise is in the folder "Problem 2". gaussian_kernelXY.m is the gaussian kernel function which returns 1D array and Problem2.m is the driver file for this function.

PROBLEM 3

The solution to this problem is in the folder "Problem3". sobel_edge.m is the function find the edges using sobel edge detection.

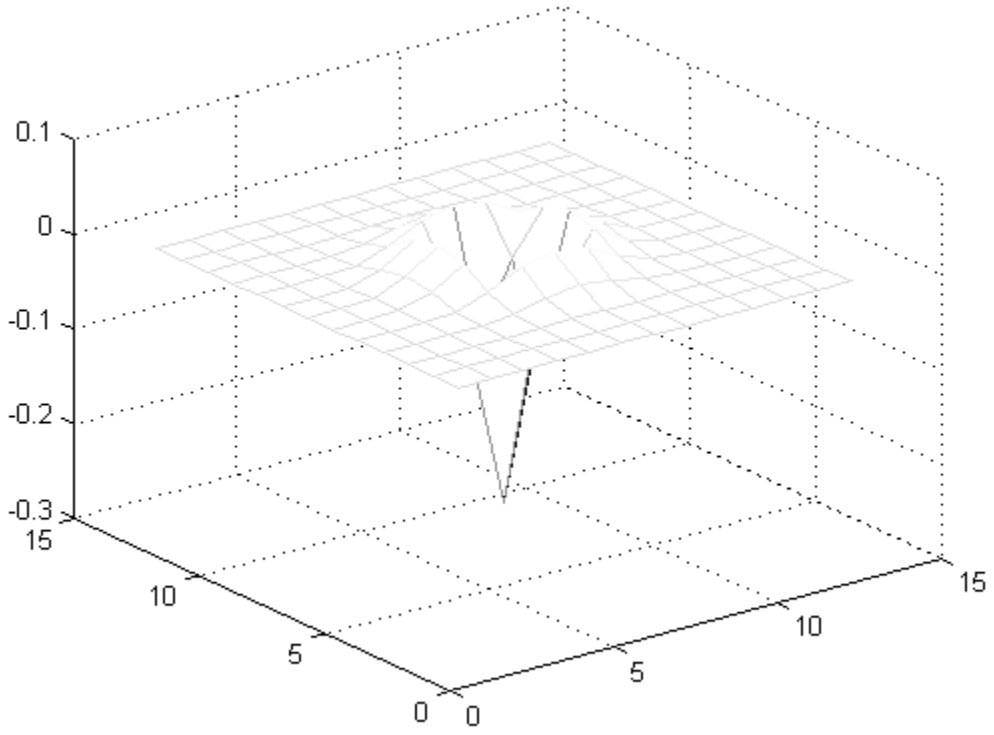
sobel edge detector on building.bmp using magnitude



sobel edge detector on building.bmp using threshold

PROBLEM 4

Below is the 2D image formed after using mesh function on the result of convolution of gaussian kernel with width 11 and sigma 1 and a Lapalacian Kernel [0 1 0; 1 -4 1; 0 1 0]. Indeed the result look loke a Mexican Hat. The solution to this problem is in the folder named "Problem4". Problem4.m is the MATLAB code to plot this 2D image.



PROBLEM 5

The threshold value that looks good to me is 0.05. The solution to this problem is kept in the folder "Problem5". zero_crossing_LOG.m is the file containing the function and Problem5.m is driver MATLAB code.

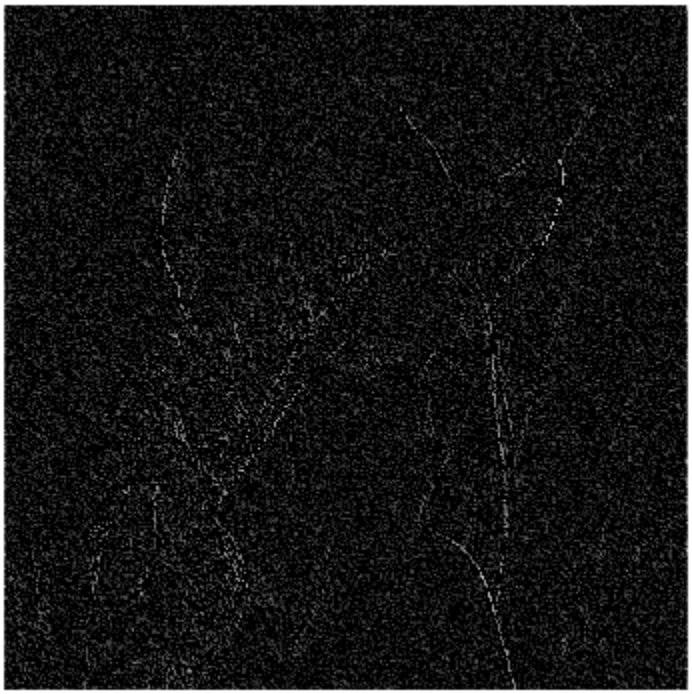
Edges of building.bmp using zero crossing method on Laplacian of Gaussian

PROBLEM 6

Below are the resultant image through canny image detector. The solution to this problem is in folder Problem6. canny.m is the canny function implemented.

canny edge detection on lena.bmp

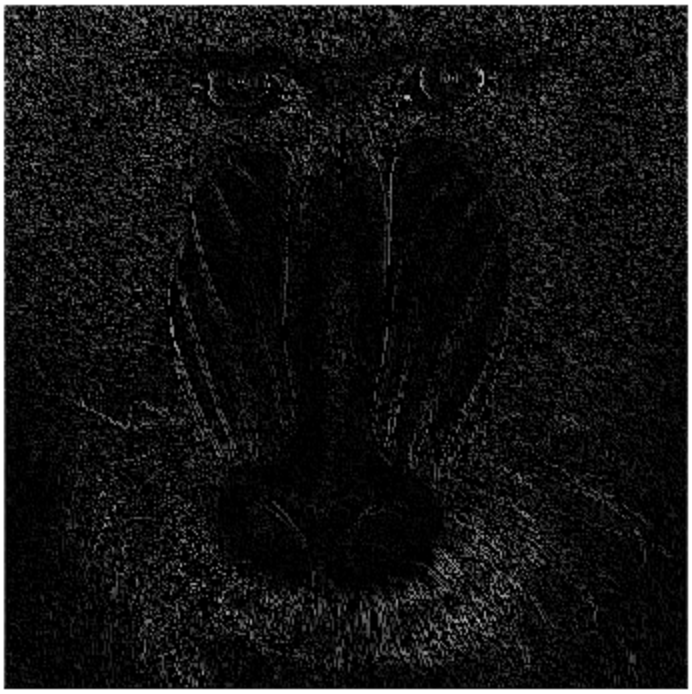
canny edge detection on lenaNoise.bmp



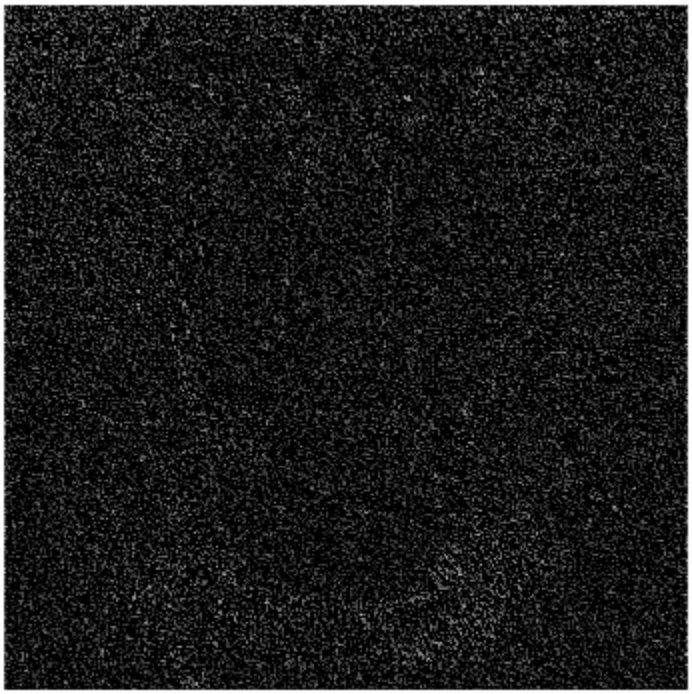
canny edge detection on barbara.bmp

canny edge detection on barbaraNoise.bmp

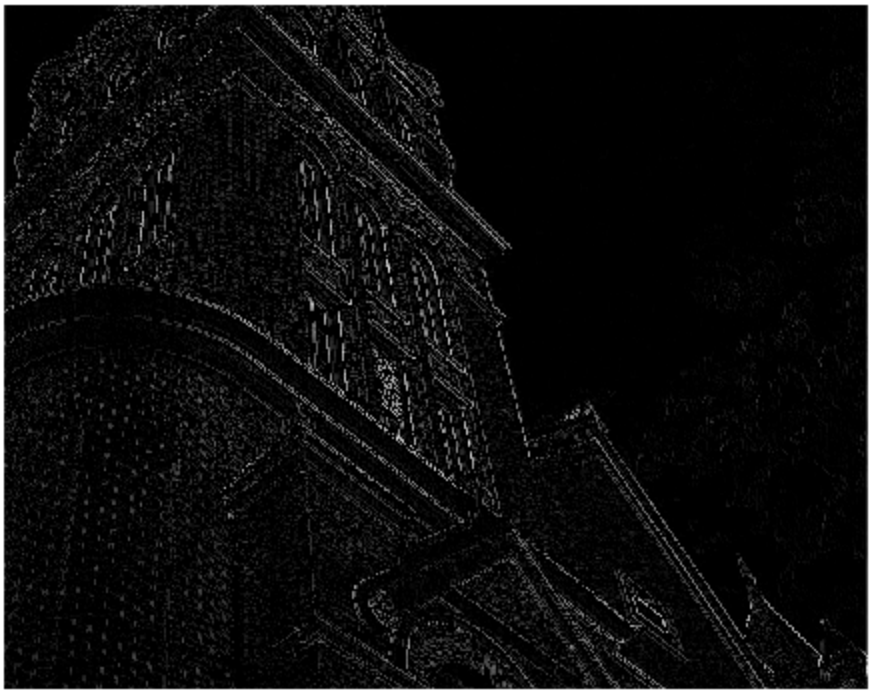
canny edge detection on mandrill.bmp



canny edge detection on mandrillNoise.bmp



canny edge detection on building.bmp

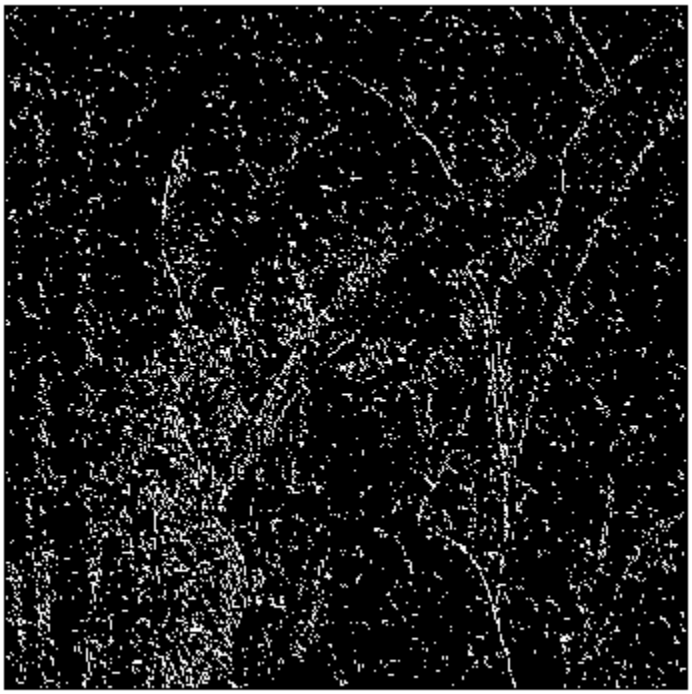


PROBLEM 7

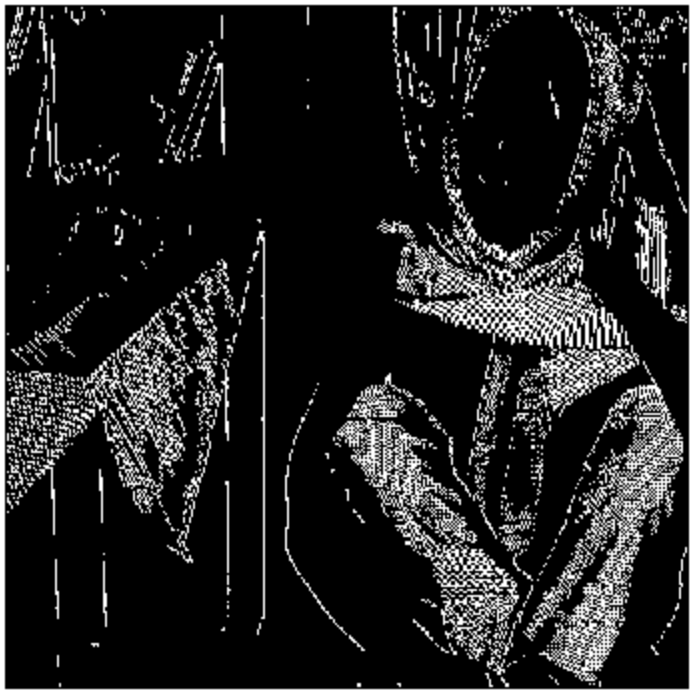
Below are the resultant image through canny modified image detector. The solution to this problem is in folder Problem7. canny_modi.m is the modified canny function implemented.

canny edge detection on lena.bmp

canny edge detection on lenaNoise.bmp

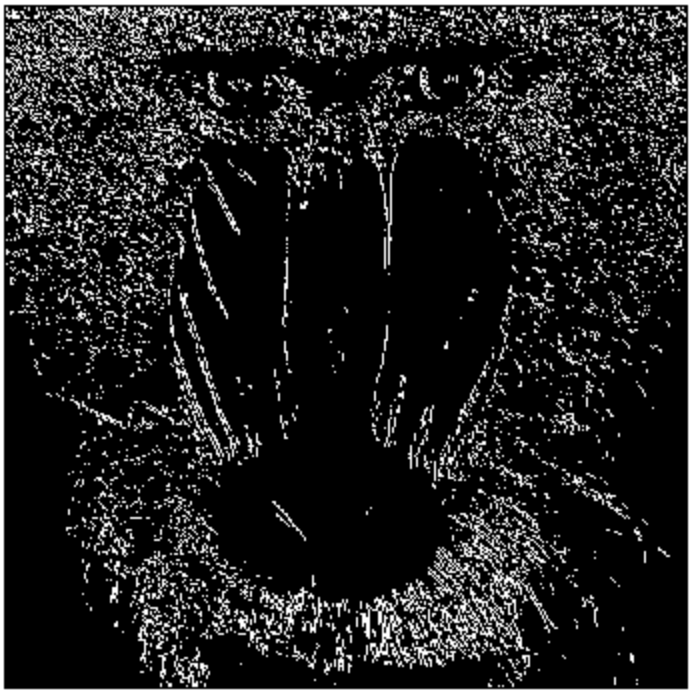


canny edge detection on barbara.bmp

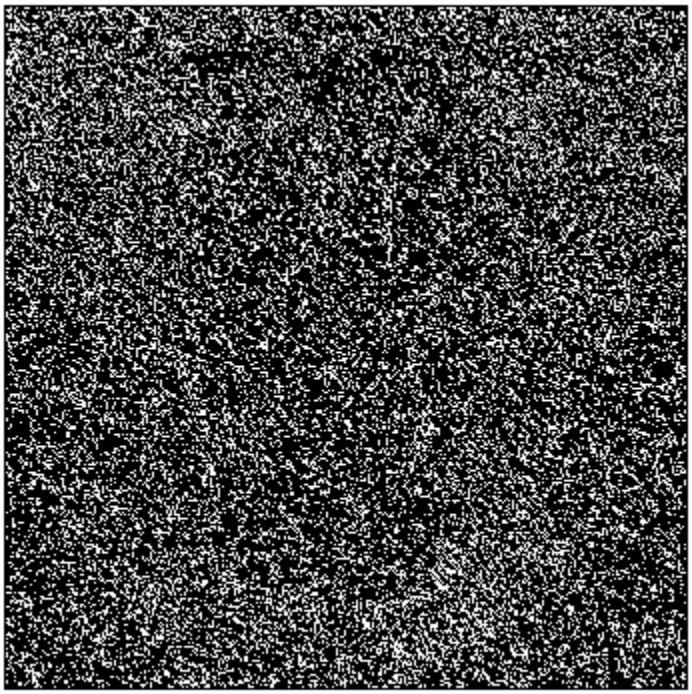


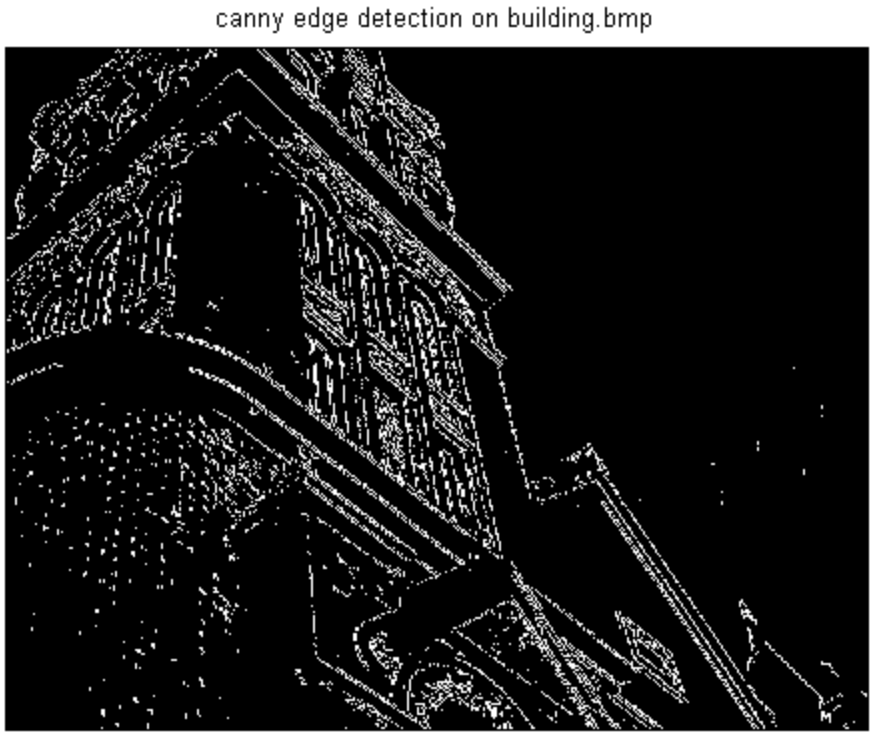
canny edge detection on barbaraNoise.bmp

canny edge detection on mandrill.bmp



canny edge detection on mandrillNoise.bmp





REPORT END

There is a report.m file which is generating the report file.

Published with MATLAB® R2014a