CMPE297 Homwork 1 HL

1. Given the image I(x,y) and the kernel shown in Figure 1, perform 2D convolution to find the output image. (Assume padding 0's outside the image)

Figure 1.

2. Given Laplace operator and 2D Gaussian function in Figure 2, derive the 2D LoG function given in Figure 3, assuming mu_x = mu_y = 0.

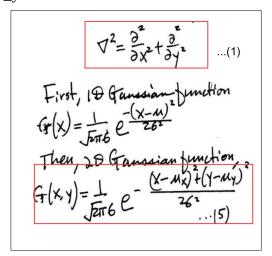


Figure 2.

$$\nabla^2 G(xy) = \frac{x^2y^2-26^2}{\sqrt{26}}e^{-\frac{x^2y^2}{26^2}}$$

Figure 3.

3. Based on the computation result given in 2, compute 3 by 3 LoG kernel, write a python program with numpy to verify your result, and then compute 5-by-5, 7-by-7 kernel.

(End)