

CSCI 8820 Computer Vision and Pattern Recognition

Assignment 4, Due Friday April 4, 2025 by 11:59 pm (23:59 EDT)

For the three given gray scale test images from the previous assignment (i.e., test1.img, test2.img, test3.img) implement the multi-scale *Laplacian-of-Gaussian* (LoG) edge detection (i.e., edge focusing) technique starting with $\sigma = 5.0$ and ending with $\sigma = 1.0$. When submitting the assignment include the following:

1. A well documented hardcopy of the source code.
2. Hardcopies of the gray scale images and the edge maps of each image for $\sigma = 5.0, 4.0, 3.0, 2.0$, and 1.0 . (**Note:** Although you will display the edge maps at σ intervals of 1.0 , the step size $\Delta\sigma$ needs to be $= 0.5$ in the multi-scale LoG edge detection algorithm). You may sample the LoG in the range $[-4\sigma, +4\sigma]$ to ensure that the resulting masks are odd in size.
3. Comments on the results obtained. **In particular, show how you can experimentally verify that the multi-scale LoG operator is indeed superior to a single-scale LoG operator?**

The three images are available in ELC in the *Images* subfolder within the *Assignments* folder.