SMU | LYLE
SCHOOL OF ENGINEERING

CS 7345 ADVANCED APPLICATIONS:

REALTIME MULTITHREADED IMAGE PROCESSING WITH CONVOLUTION FILTERS

Overview: Create a multithreaded library and application that will take input images/video and apply convolution effects in realitime.

Filter Types:

1. Project should use either 3x3, 5x5, 7x7 or 9x9 kernels
2. Project should include at least 6 convolution filter effects.
    a. The following 4 techniques are required: Sharpen, Emboss, Gaussian Blur, and Laplacian of Gaussian (LoG)
    b. You may pick any other 2 filters/kernels
3. Convolutions should be performed in library code, with resulting image passed back to application
    a. Convolution should be multithreaed
    b. Segment image data and pass (provide access) to specific rows to individual threads
    c. Each thread should perform the selected convolution on the supplied data set and return the resultant convoluted data to calling thread
    d. Upon all threads completing convolution, combine results into new image data
4. Results of convolutions should be show in realtime.
    a. Images can be uploaded/included in application or can be grabbed from web camera with effects applied in realtime.
5. Application should allow user to apply/remove effects in realtime