SMU | LYLE SCHOOL OF ENGINEERING

CS 7345 ADVANCED APPLICATIONS:

REALTIME DISTRIBUTED IMAGE PROCESSING WITH CONVOLUTION FILTERS

Overview: Create a networked distributed 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 distributed via networked clients
    b. Segment image data and pass (provide access) to specific rows to individual clients
    c. Each client should perform the selected convolution on the supplied data set and return the resultant convoluted data to server
    d. Upon all threads completing convolution, combine results into new image data
    e. Combined results can be displayed in a client or via server.
        i. Client or server can create work, and a client can either be either (or both) of the following worker (performing convolutions) or a viewer (displaying results of convolutions)
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