Programming Assignment #2; Due Date:10/28/2019

Submit your code via CANVAS. Also submit a TYPED REPORT that contains, concise discussion on your observations from the results and any reasoning necessary to explain your approach. The report should contain, results that are arranged to show the input image and the output images, if and when applicable. Try to minimize your page usage by displaying at least 3 images per row on a page. All your image displays must have a caption.

1. **Bilateral Filtering:** Implement the bilateral filter described on page 110 of the text book and apply it to (i) your color face image, (ii) a color image of the french fries in front of the CISE building and (iii) a color image of the UF century tower building. Note that you will have to reduce the size of the images to say $(64, 64)$ before applying the bilateral filter otherwise, the filtering operation can be very slow.

2. **Halloween Horror Show via Pyramid Blending:** Develop code for exercise 3.20 page 176 from the course text book by Richard Szeliski. See figure 3.43, page 143 of the text book for an example of the results of pyramid blending. For test images, choose your own face image and an image of your own palm. You should create a binary mask of a resonable size and shape to capture the feature of your face (eye for instance) you want to use for blending. For your results, you will include: (i) the original images (your face, your palm and the binary mask), (ii) three images showing the images from the low, mid and high levels of the Gaussian and Laplacian pyramids in two rows. Top row showing the Gaussian and the bottom row showing the Laplacian pyramid images.(iii) The belnded image at the original resolution of the face and palm images.

   For this problem, your code should have two key procedures, (i) Reduce and (ii) Expand. The procedure reduce will smooth and downsample the image (at say level 'k') to create an image at level (k-1) in the Guassian pyramid. The procedure Expand will expand the image at level (k-1) in the Gaussian pyramid to the same size as the image at level 'k' and take the difference between the image at level 'k' and this expanded image to get the Laplacian image at the corresponding level in the Laplacian pyramid.