CENG 391 Introduction to Image Understanding

October 27, 2016

Image Blending with Pyramids

Exercise: Write a C++/Python program that takes name of two objects as an argument and do following operations.

1. Read images that belongs to corresponding object as follows:

   Constructing a structure for both objects that includes

   (a) "object1_Gaussian_0.png"

   (b) "object1_Gaussian_1.png"

   (c) "object1_Gaussian_2.png"

   (d) "object1_Gaussian_3.png"

2. Generating expanded levels by executing given source code as follows:
   $./pyr\_up < input\_image >< number\_of\_levels >< base\_name\_of\_output\_image >$
   i.e.: $./pyr\_up < pen1\_Gaussian\_3.png >< 3 >< pen1 >$

3. Generating a Laplacian Pyramid for both objects and store them in a structure. In Figure 1 laplacian pyramid generation is shown.

4. Adding left and right halves of both objects in each level of corresponding Laplacian Pyramid.

5. During the above operation, weighting pixels that are located on the middle column and one pixel-neighbourhood. The operation is shown in Figure 2.

6. From the beginning of the last level of the combined Laplacian pyramid, by calling the "pyr_up" executable and obtain the upper level. Then, you should sum it with corresponding level of the combined Laplacian pyramid like shown in Figure 3.

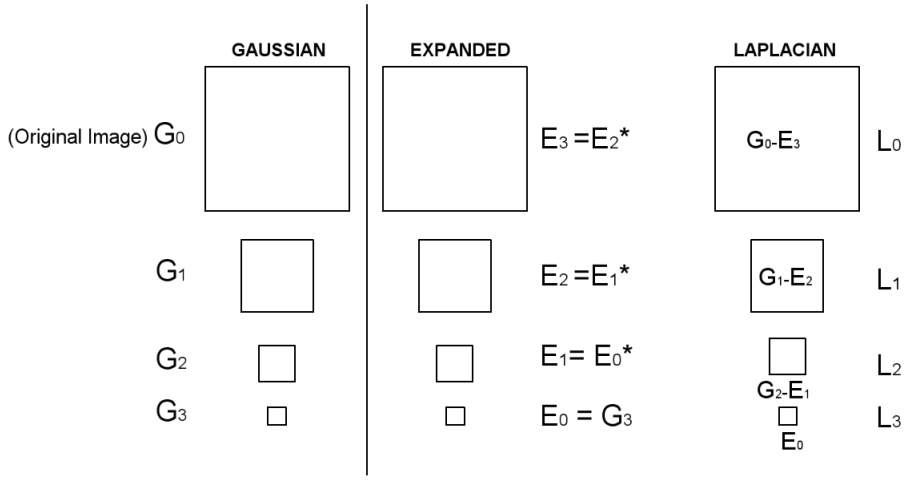

Figure 1: Gaussian & Laplacian Pyramids. * operation respresents "pyr_up" executable.

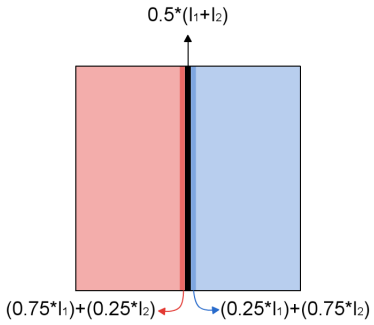

Figure 2: Weigthing of middle pixels.

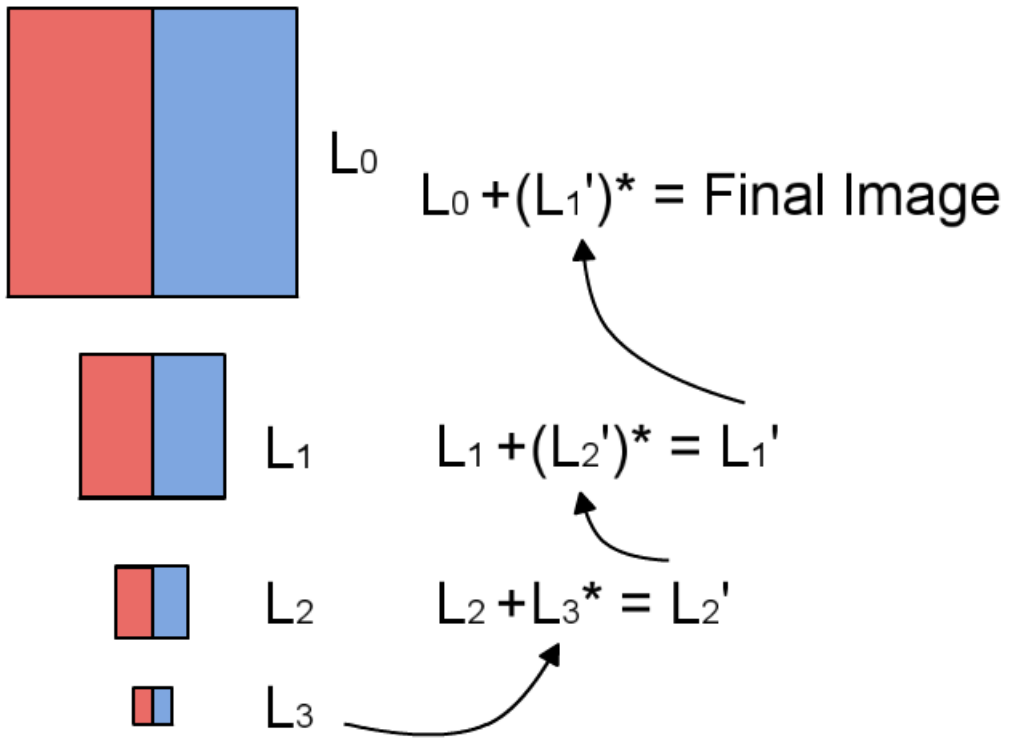

Figure 3: Image Blending. * operation respresents "pyr_up" executable.

Pen1 Pen2 Pen1&Pen2

Figure 4: Input images and expected output.