

CSC320— Visual Computing, Winter 2005

Assignment 4: Image Blending

Due: noon, Fri., Apr. 8 (in D.L. Pratt, Rm 283)

This assignment is worth 10 percent for your grade in this course.

In this assignment you will develop a Matlab implementation of image compositing (or blending) using Laplacian pyramids. The basic algorithm to be implemented is described on p. 13 of the Lecture Notes on Image Pyramids, available from the course homepage. In addition, you will also implement one small variation on this basic algorithm.

Preparation. Begin by reviewing the first 200 lines or so of `pyramidTutorial.m`, available from the tutorials directory in the Matlab `iseToolbox`.

Test Image Pair. Download the images `apple.pgm` and `orange.pgm`, along with the mask image `mask.pgm` from the course homepage. The mask image currently has the values 0 and 255, and will need to be divided by 255 before using it as the mask in the blending algorithm. Arrange the blend so that the `orange.pgm` image appears on the far right side of the blended image and `apple.pgm` appears on the left side (i.e. set image $I_1(\vec{n})$ to be the `orange.pgm` image and $I_2(\vec{n})$ to be the `apple.pgm` image).

Starter Code. There is no specific handout code for this assignment. However, Matlab code for both Gaussian and Laplacian pyramids is available from `pyramidTutorial.m`. You are encouraged to copy this code in your implementation.

Variation. In addition to implementing the algorithm described in the lecture notes, try the following variation. Before using the mask image `mask.pgm` (scaled down to be in the range $[0, 1]$), blur it with a 2D Gaussian filter with standard deviation σ_b . Use this blurred mask image as the first image in the Gaussian pyramid, and build the successive levels of the Gaussian pyramid from this blurred mask (i.e. the only change from the original algorithm is to replace the original mask image with a blurred mask image). This preblur should provide a slower transition between the apple and orange. Try $\sigma_b = 8$ or 16.

What to Hand In. Include a short write up describing your program and your results. Include a printed listing of your program(s). In addition, include printed output images for the blended apple-orange image using the original algorithm, as well as the results for the variation described above (try a couple of different values of σ_b). Finally, electronically submit your Matlab code in one zip file titled `blending.zip` (it could consist of only one Matlab script file, or several M-files).