

Homework #2: Image Processing with Brook
Due Date: Tuesday, 14 May 2002

In this assignment you are going to program a simple image processing application in the high-level stream language Brook. The processing will involve the following steps:

1. Read an input image file into a stream of pixels. The image will be an array of integers representing intensity levels.
2. Read a 7×7 convolution kernel from a file into a stream.
3. Convolve the input image with an arbitrary 7×7 kernel.
4. Calculate a histogram of the pixel values. The number of bins should be variable.
5. Output the convolved image to a file, and the histogram to the screen.

The command-line options should include *input image file name*, *convolution kernel file name*, and *number of histogram bins*.

As before, please complete this assignment in groups of up to four people. For your write-up please include the Brook code, the directory from which we can test it, and your impression and experience with programming in Brook. There is no timing simulator for resulting Brook code so you should perform and analyze “optimizations” in the spirit of streaming.

Also, please note that the current compiler will allow things that it should not. If you are not sure whether what you are doing is valid or not please come see us.

Technicalities

In order to compile and run Brook programs you will need to log in to one of the “raptor” leland machines. Simply `ssh raptor` and use your leland username and password.

All you need to do after logging in is to create a directory for your program and a Brook makefile. You can find skeleton program and makefile in `/usr/class/ee482c/hw2`.

This makefile will create a `bin` subdirectory in the program directory where it will put the brook executable.

Remember that Brook is a superset of C and not C++, and that you have access to any C function or library.