

ECE 4310/6310 Introduction to Computer Vision

Lab #1 – Convolution, separable filters, sliding windows

In this project each student must implement three versions of a 7x7 mean filter. The first version should use basic 2D convolution. The second version should use separable filters (1x7 and 7x1). The third version should use separable filters and a sliding window.

All three versions of the filter should produce the exact same output. This must be verified by comparing the images using “diff” or a similar program and showing the method used and result.

Each version of the filter should be timed, and the typical amount of time reported (for example, the average amount of time over ten runs).

You must write a brief report that includes the code for each filter. The report should summarize and compare the amounts of time each version of the filter takes.

C-code for smoothing a 512 x 512 image is posted at the class website. The program contains code demonstrating a 3x3 mean filter using basic 2D convolution, and how to time a piece of the program. You can use this code to derive a solution to this lab.

The report is due date is given at the web site. Reports will be collected in class.