CS 5420	**Visual Data Processing**	Test 2
Name:	Winter 2004	Max Pts: 40

Important: This is an open book test. You can use any books, notes, or paper, but not exchange anything with other students. You are not allowed to use any electronic/communication devices, including a calculator. *Do not log into the computer during the test.* Any calculations and rough work can be done on the back side of the test pages. You will lose five points for not writing your name.

1. [10 pt] I have a gray-scale image that is mostly dark but with a few bright points. The number of bright points is less than 10% of the total pixels. The bright points do not allow me to stretch contrast easily. Suggest an algorithm/method to perform contrast stretching on this image such that I can see the details in dark areas.

2. [10 pt] Explain the difference between histogram equalization and histogram matching.

3. [5 pt] Give a single C/C++ statement to determine the ith bit plane in an 8-bit grayscale image. That is, the resulting pixel value should be 0 if ith bit is 0, and 255 if ith bit is 1.

4. [5 pt] Why is it not possible to realize ideal lowpass filter in hardware electronic devices?

5. [5 pt] What is the advantage of Gaussian lowpass filter over Butterworth lowpass filter?

6. [5 pt] In this class, we did all our projects in RGB color space. Can you think of some applications that are better done in HSV space? When will you need the CMY space? What will be the advantage of L*a*b* space?