600.161 Exploring Vision in the Real World
Intersession 2009

Laboratory 1

Review

1. What is a Bayer filter and explain why the colors are distributed like that?
2. If an RGB pixel has the values (45,91,211), what is its corresponding YIQ values? HSV values?
3. What makes HSV (or HIS) more advantageous than RGB?
4. What does it mean for an image format to be lossy? Why is it advantageous?
5. What is the difference between computer vision and computer graphics?

Matlab

Implement the following image processing operations below in Matlab. Use an M-file to run the commands instead of straight command input. Please do not use built-in Matlab functions to do the flipping and concatenating (ie fliplr, flipud). Use for loops and other Matlab matrix tricks.

You are welcome to discuss the problems with other students, but the work must be your own.

1. Load street1.jpg and street2.jpg
2. Scale street1 so that it is half the original size. Do this so that the smaller image is now set to num2.
3. Horizontally flip street1 so that it is a mirror image of itself. Save this in num3.
4. Vertically flip street2 so that it is a vertical image of itself. Save this in num4.
5. Concatenate street2 to the right side of street1 to create a bigger image. Save this in num5.
6. Add street1 with street2. Save in num6. What happens to the image?
7. Look at the mamtrix representing the grayscale of street1. Note that the values are in the range of 0 to 255. Round each value to the nearest ten. For example, 17 becomes 20, 43 becomes 40. Save in num7. Display the image. What does this do to the image?

Now save your .m file and email to Henry.