REU Summer 2012

Exercises. Session 1

1) Using the Matlab rgb2hsv function, write a program to display the individual hue, saturation and value channels of a given RGB colour image

Help:



2) Considering the Roberts and Sobel edge detectors (see slides), apply them to three-channel RGB images and display the results. Display the results as a three-channel colour image and as individual colour channels (one per figure).

Note how some of the edge responses relate to distinct colour channels or colours within the image. When an edge is visible in white in the edge-detected three-channel image, what does this mean? Repeat this task for the HSV colour space. How do the results differ in this case?

3) In the code that calculate the Smoothing Gaussian, the filtering (convolution) is performed in 2 steps: temp=conv2(double(image),double(gaussiano),'same');
smooth=conv2(double(temp),double(gaussiano'),'same');

instead of a single convolution of a rectangular Kernel. Why do you think it was done in this way? How could you build the Sobel Kernel in the same way?.

4) Download another implementations of Optical Flow from Ce Liu, and Tomas Brox webpages. http://people.csail.mit.edu/celiu/OpticalFlow/

http://lmb.informatik.uni-freiburg.de/resources/binaries/pami2010Matlab.zip

Test the optical flows in some couple of images that you can get. From your point of view which one is better?

Homework. Session 1

Minimum Required.

* Implement the Lucas-Kanade Optical flow algorithm. Follow the directions from Dr Shah's class.

Desirable.

* Implement the Lucas-Kanade pyramidal algorithm