Work lab 1: Digital Images

1 Overview

The goal of this lab work is to understand from a practical point of view the main properties that characterize a digital image.

In order to facilitate your initiation in working with images, a notebook with a Python structure is provided.

A set of color images (RGB) to work with can be downloaded from Moodle. You only need to work with one of them (check the image info in Moodle).

2 Tasks

1. Open, Transform and Show the three components from the RGB original image.
2. Transform the original color image selected to the HSV color space and show the three components from the HSV image.
3. Obtain the histogram of the six components: R, G, B, H, S, V.
4. Select the R-G-B component with the high contrast and use it in the next tasks.
5. Generate a set of 5 images through a 4-step iterative process of reducing by 2 the number of rows and columns of the original image. That is, if the original image has N rows and M columns, the sizes of the rest of the images will be $N/2$x$M/2$, $N/4$x$M/4$, $N/8$x$M/8$ and $N/16$x$M/16$.
6. Generate a set of 4 images, by reducing the number of bits used to represent the gray values of the original image by 2, three times.
7. Elaborate a report with the assignments included in the next section.

3 Assignments

- Summarize in a table (similar to the include below) the asked statistical values corresponding with the 6 color components of the original image.

	R	G	B	H	S	V
Minimum						
Maximum						
Mean						
Std deviation						

- Include the six color components and their histograms and discuss the similarities and differences between then in relation with the visual characteristics of the different colors components.
- Include the set of images produced in task 6 and explain the differences between them.
- Include the set of images produced in task 7 and explain the differences between them.

4 Important Dates

- Deadline for submission: due April 17th.

5 Grading Policy

This practice contributes to 25% of your final grade.