Practical work N°3

Objectives:

     1. Histogram analysis

     2. Apply arithmetic and logical operations between images

Commands

– **imhist(A)** : Display the histogram of A

– **B=imhist(A);** B is a vector that contains the histogram of A. % B is of type double

– **B=imadjust (A, [x y], [0 1]) :** histogram stretching of image A, x and y are double ∈ [0, 1] that represent respectively the low and the high gray level in A.

– **B=histeq(A)** : equalization of the histogram of A. % B is double ∈ [0, 1]

– **B=cumsum(imhist(A)) %** B is a vector that contains the cumulative histogram of A

– **cat(3,A,B,C) :** the concatenation of three matrices

Exercise 1

Write a script that allows to:

     1. Load an image A **cameraman.tif**

     2. Display in the same figure, the result of thresholding of A with values **0.2, 0.9** and the default value.

   - Repeat the same work with **naruto.jpg**

Exercise 2

Write a script that allows to:

     1. Load an image A **rice.png**

     2. Add (image B) and subtract (image C) the value 90 to A, and show the histogram of the A, B and C in the same figure.

Exercise 3

Write a script to:

     1. Read the image A **tire.tif**

     2. Create an image B = equalization of the histogram of A

     3. Display images A and B on the same figure

     4. Compare the contrast measurements of A and B. (B will be the best)

  - Repeat the same script for image **nature.jpg**

Exercise 4

Write a script that:

     1. Read an image A **pout.tif**

     2. Stretch the histogram of A using the formula seen in the lesson

     3. Display images A and B and their histograms on the same figure

     4. Compare the contrast of A and B

Exercise 5

Consider two images **A.jpg** and **B.jpg** detected by a surveillance camera in two different times.

Write an Octave script that shows motion detection in this surveillance system.

Exercise 6

Write a function **EQUA (image)** which performs the histogram equalization of **image** (see the formula in the course), then test **EQUA (image)** on **pout.tif** and compare the result with **histeq**.