OpenCV – Basic image manipulations

Preliminary remarks

- You will find at this address: https://docs.opencv.org/4.5.4/d9/df8/tutorial_root.html (openCV 4.5 Tutorials) a large part of the information that you need for this lecture.
- You will make a new project for each exercise.
- No classes, only functions except for the exercise 5.

Exercise 1 – cv::Mat

Create a first project which will contain a *Mat* object (4x4 RGB floating point image fill with red pixels). Use *cout* in order to display all the values of this image.

Document :

- https://docs.opencv.org/4.5.4/d6/d6d/tutorial_mat_the_basic_image_container.html (Mat)

http://www.cplusplus.com/reference/iterator/ (iterator)

Exercise 2 – Array of images

Create a *vector* of 8 RGB images (height 500 px, width 750 px). Each of these images will contain only one color (red, green, blue, yellow, cyan, magenta, white and black) filled with a double loop (height then width). Display all these images with *imshow.*

Documents:

- https://docs.opencv.org/4.5.4/d5/d98/tutorial_mat_operations.html (imshow)
- http://www.cplusplus.com/reference/vector/vector/ (vector)
- C++ - Templates

Exercise 3 – Read and save images

Load a gray level image with *imread* and add a red frame to this image. The size of this red frame must be passed as parameter to the function in charge of this processing. Save the result image as a color image with *imwrite*.

Document:

- https://docs.opencv.org/4.5.4/d5/d98/tutorial_mat_operations.html (imread and imwrite)

Exercise 4

Organize all the source code of this lecture in one project. You will have to transform all the corresponding *main* functions in global functions (defined in 3 ".cpp" files and declared in 3 ".h" files). All these functions will be part of the *psrs* namespace.

The *main* function of your project will have to call sequentially these 3 functions.

Document:

- C++ - Namespaces

Exercise 5

Try to organize all the source code in one class.

Document:

- Object Oriented Programming