Assignment 1

Computer Vision 2017/2018

Due date: March 5th, 2018

Implement a simple program using C++ and the OpenCV library that:

1. Loads the image named “a.jpg”
2. Converts the loaded image to grayscale (8 bpp). We refer to this image as `Ia`
3. Computes the image histogram
4. Applies the Otsu global thresholding method to `Ia`. We refer to the obtained thresholded image as `Ibw`
5. Saves the produced thresholded image as “abw.png”
6. Loads the image named “b.jpg”
7. Converts the loaded image to grayscale (8 bpp). We refer to this image as `Ib`
8. Produces a new image `Imix` with the same size of `Ib` in which the intensity of each pixel `Imix`(u,v) is equal to `Ia(u,v)` or `Ib(u,v)` depending if `Ibw(u,v)` is white or black, respectively
9. Saves the produced `Imix` as “mix.jpg”

For reference, what follows is a preview of the expected image “mix.jpg” that should be produced by your code:

Notes:

There are no particular constraints on the number of function/classes/cpp files produced as long as no additional libraries are used except for OpenCV.

Comment your code whenever possible. Since no additional report is required, source comments are a good way to clarify what your code is supposed to do. Small bugs may not hinder your assignment as long as I can understand what is going on.

A clean organization of the program code is considered a plus and promotes the recycling of code for your final assignment.

Additional requisites:

The following OpenCV functions cannot be used:

- cv::calcHist
- cv::threshold
- cv::adaptiveThreshold

How to submit

Make sure that your program compiles and works on a system with Ubuntu 16.04 Xenial or newer (use lab computers as reference). Then:

1. Remove both the dist and build subdirectories. **You must not submit any executable or object file**.
2. Add a README file if appropriate (example you want to clarify some of the choices you made in the assignment or some additional features you implemented). It is also a good idea to write your name and surname in the README
3. Compress the whole project directory to a zip or tar.gz file
4. Name the project package you submit as: <name>_<surname>_assignment1.zip
5. Submit via moodle

Please remember that the assignment has to be done individually. You are not allowed to group into teams and submit the same source code for more than one person.

For any question feel free to mail me at filippo.bergamasco@unive.it.

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