

Project #1 Color, Texture, and Shape

Due February 24, 2014 5:00pm

Description

In this project, your team needs to work together to implement the algorithms to extract the color, texture, and shape features you learnt from lecture II, including color histogram, color correlogram, local binary pattern histogram, and histogram of oriented gradient. Your team should also implement at four different distance functions include L1, L2, Chi-Square, and the KL-distances, and two similarity functions include Cosine similarity and histogram intersection.

The team needs to implement all these algorithms and package them for future use:

- Please use OpenCV library or other image processing libraries if you want a convenient tool for read/save/access images. However, you cannot just use the corresponding functions extracting the above features in these libraries to be your homework. You need to implement the algorithms by yourself as a team.
- Your team should have a design on how you will organize the code you wrote. Please clearly define the function interface as an API for others to use your library. Note all algorithms come with certain parameters which need to be specified, such as the number of quantization levels, or number of clusters in k-means. You should make your function design to be as flexible as possible to allow the settings of different parameters.
- Your team needs to implement all four algorithms.
- You should also have a main function and a small number of images to test your algorithm and demonstrate how your functions can be called. This will also help us to grade your code in the end.

Bonus

The team has the option to implement other low level features to describe the image outside what we learnt in the lecture. Your team need to dig around to decide which features you would like to implement. Each new features you implement bring each of your team member 1 points in the final grade.

What to turn in?

You should make a team report in a PDF file and name it as:

[lastname1]_ [lastname2]_ [lastname3]_ [lastname4]_ [lastname5]_PROJ1.pdf

For your program, you may use any programming language. However, your submission should include the executable, the source code, and a detailed readme file on how to run it. You should

have a detailed report in the written part of your homework on what you have tested and what are the results you obtained. Please make sure you packed additional dependent libraries, if any, used in your program. If your program cannot run, you lose 0.5 point automatically.

Package your PDF file with the code and supplementary Readme file in a single ZIP file as:

[lastname1]_ [lastname2]_ [lastname3]_ [lastname4]_ [lastname5]_ PROJ1.zip

and please submit it through the Moodle system.

Grade: 10% with bonus

Late submission policy applies universally with no exception.

If you have a compelling excuse, you must inform me at least 2 days before the due date. I don't accept excuses such as "**I am overloaded by other courses**".