Homework 3:
Image Segmentation

In this assignment, you will write computer programs for image segmentation. You are encouraged to use C/C++ programming.

Image segmentation is a classical problem in Computer Vision. The goal of image segmentation is to partition of a given image into different regions, where each region is an object (or part of an object) or the background scene. In the lecture, we have discussed several techniques for image segmentation, and now there is an opportunity for you to try different segmentation methods.

You can use OpenCV, which is an open source computer vision library, for image reading and writing.

You can use some online code for obtaining your segmentation results. But you need to show clearly where you got the code, and how to use the code for your homework.

There are two parts for this assignment. You need to complete both parts. The input images can be the ones you downloaded for your HW2. Then we may use other images to test your code.

Part I

Use two classical methods for image segmentation: (1) k-means clustering; and (2) normalized cut.

Submission: You need to write a short report that contains your C/C++ code, input and output images, simple descriptions of the method, how you choose the parameters if any, what difficulty you have in this assignment, and how you solve the problems. Please do not send your homework to me by emails unless you are notified. Your submission is hard copies.

Part II

You will find another segmentation method that can perform better than the two methods that you used for Part I. It is determined by you to find a new method in the literature. You can use a completely different method for Part II, or you may consider to combine the two methods in Part I to get a better result. Either one is OK for your Part II.

Submission: Your C/C++ code, segmentation results, and comparison to the two methods in Part I.

- Assigned on March 1, 2017
- Due date: March 22, 2017
- All submissions are hard copies, not emails.
- Your algorithms will be tested with new images.

Your hard copy submission is half of the work. Your code will be tested on new images in the Computer Vision Lab. I will request your code to run at the lab machine to test the performance of your program later. You need to make sure your code can run well on the test data.