ECE 661: Homework 6

October 23, 2012

Due: October 30, 2012 (Tuesday) before class

Problem:

The goal of this homework is to segment out a region of interest from a color image. The image shown in Figure 1 depicts the second deepest lake in the US; it is called Lake Tahoe and it is located at the border between Nevada and California.

Your homework consists of using Otsu's algorithm to segment out the lake out from the image. However, note that this is a color image. You will first need to call `cvSplit` from OpenCV to split the image into three separate "grayscale" images for the R, G, and B planes. You can then find the best segmentation threshold by Otsu's algorithm in each color plane. Subsequently you can merge the selected color plane pixels into an RGB image that will just show the lake region.

After you have separated the lake from the rest, extract the contour of the lake. Your output must include both the segmented image and the contour.

The Lake Tahoe image is provided at `http://web.ics.purdue.edu/kim497/ece661/homework/ECE661_2012_hw6_image.zip`.

Don't forget that you have to write your own code for Otsu's algorithm and for the contour extraction algorithm.

Submission of Your Work:

You should turn in a report in pdf format of your homework solution using the blackboard. The report should include

1. A brief outline of how to do Otsu's algorithm in color space.

2. The segmented results with the binary image and the contour.

Figure 1: A sample image of Lake Tahoe from space

3. Your source code along with comments.

The work you turn in must be your own as the typed report!

Notes.

- Clearly identify the steps you have taken to solve the problem with your own words.
- Your grade depends on the completeness and clarity of your work as well as the results.