CS6243: Computational Photography [Assignment5 – MISC]
Assigned: ***March 27, 2017 (Monday)***
Due: ***April 5th, 2017 (Wednesday 5pm – via email)***

Goal of this assignment

1. To implement either Seam Carving or Texture Synthesis
2. To give you an opportunity to implement a very cool (and useful) idea

IMPLEMENT ANY ONE (1) OUT OF TWO (2)

1. Seam Carving

Implement the seam carving algorithm described in the paper by Avidan and Shamir. The paper does not go into a great deal on the implementation of the "dynamic programming" algorithm to determine the seams, but you should be able to design something reasonably close to their approach (if not exactly the same).

Your implementation doesn't need to be interactive, but you should allow the user to specify the number of seams like to carve (or expand) in either the horizontal or vertical direction.

It might be a good idea to use (and compare your results with) the images from:
http://swieskowski.net/carve/

2. Texture-Synthesis

Implement the texture synthesis algorithm described in Efros and Leung paper. Note that you can find a multitude of on-line code to do this (this is a very popular topic and given as an assignment in many classes), however, *you should do this by yourself*. I plan to ask you very detailed questions about your code.

You should implement two versions of your synthesis technique. The first is to grow a larger patch, the second is to fill in a "hole" in an image (synthesizing pixels one pixel layer at a time until the hole is closed). Pseudo code for this can be found at:
http://graphics.cs.cmu.edu/people/efros/research/NPS/alg.html

You may play around with this basic algorithm, in particular, raise the threshold of good matches, and modify the size of the patches. Note that synthesis written in Matlab will be very slow, so you may consider doing this in C/C++.

Examples to work with are provided in the directory with this assignment, you can easily find more online.

SUBMITTING YOUR ASSIGNMENT
Programming Language
You may use any programming language you want. But a warning that task 2 may be slow in matlab.

What to turn in?
1.) README File
Turn in a short writeup on which tasks you implemented. For the implemented task, provide a short description of your implementation followed by results from your output.

2.) Code and Images
Include your code and output images.

Make the following directory tree structure:

~\assignment5\Readme.{doc,tex,pdf}
~\assignment5\t{1,2}\yourfiles

Please double-check your zip file to make sure everything is in order.

Example, if your name is Zhang Bo, then name your submission will be:
zhangbo_assignment5.zip.

How to turn in?
Send me an email with the an attachment or a link to the file.