UNIVERSITY COLLEGE LONDON
IMAGE PROCESSING
ASSIGNMENT 2 -- Poisson Image Editing
December 8, 2018

INSTRUCTIONS

This is the final coursework for the Image Processing module. This coursework is on Poisson Image Editing. We recommend you use Matlab, but you may also use C/C++/Java.

This coursework requires an online submission via the moodle page.

Submit your code and also the results that you have obtained for each task of the assignment on some example images. Please create a Results folder and add results for each task there.

Assessment of this coursework will be oral (the same way we did for Coursework 1).

SUBMISSION DEADLINE: The coursework is due January 7th 23:55 PM (Monday). We will use the following late policy:

- Submissions after the deadline but within 24 hours of it will be marked down to 90% of the number of points achieved.
- Submissions later than 24 hours, but within 48 hours from the deadline will be marked down to 80% of the number of points achieved.
- Submissions later than 48 hours will receive 0%.

AFFILIATE students who are not at UCL the second term should submit their code + a report describing each of the tasks and where you include figures illustrating the results you have obtained.

Note: This coursework is quite different from the previous ones. The descriptions are intentionally sparse so that you are forced to read and understand the paper. The coursework will take time – not because the implementation is difficult, but because you have to first understand the paper. We hope that you will eventually find the process very rewarding. Start now!

Do not hesitate to contact me (I.agapito@cs.ucl.ac.uk) if you are stuck even after an honest effort. The paper you are going to read and implement is quite a classic in this topic. That means you can probably get patchy implementations if you search on the web. Please, DO NOT go down that path. You have only access to the paper and to the slides I have given you and you are free to discuss the paper (not implementation) with your classmates.

COURSEWORK DESCRIPTION

In this coursework, we will be learning about image editing focusing on cloning, gradient based editing, etc. The coursework is based on the following paper "Poisson image editing", P. Pérez, M. Gangnet, and A. Blake, Siggraph 2003 .

Task 1 (40 points)

Select a grayscale image. Mark out a region using a polygon (you can use rpoly). Remove the selected region and fill it in using Equation (2) in the paper. You are solving for unknown intensity values inside the region R. Test the method in smooth regions and also in regions with edges (high-frequency). Also report the behavior as the size of the selected region increases.

Task 2 (40 + 40 points)

Now we are ready to try 'seamless cloning'. The relevant Equations are (9) to (11). Perform both versions (a) importing gradients and (b) mixing gradients.

Task 3 (20 points)

Repeat task 2a for color images. You have to process R, G, B components separately.

Task 4 (20 points)

Select images you like to edit and show interesting effects. Try to record the intermediate results; you can allow multiple strokes in this stage. Try to create some 'cool' effects.

Task 5 (40 points)

Implement only one of the selection editing effects described in Section 4 of the paper. You can decide between: texture flattening, local illumination changes, local colour changes or seamless tiling.