UNIVERSITY COLLEGE LONDON
IMAGE PROCESSING
PRACTICAL -- Poisson Image Editing

INSTRUCTIONS

In this coursework you will implement Poisson Image Editing in python.

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. During the oral presentation, you will be asked to run your code on your own chosen images on Tasks 1-4.

SUBMISSION DEADLINE: The coursework is due on Monday January 8th 2024 at 4pm.

Note: The implementation of this coursework is not difficult. What might take you more time is to understand the paper that it is based on. But that is why I will be giving a lecture about this paper and will describe the algorithm step by step. We hope that you will eventually find the process very rewarding. Start now!
You can contact me (l.agapito@cs.ucl.ac.uk) if you are stuck but please first have an honest effort.

The paper you are going to read and implement is 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. 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 (25 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 (25 + 25 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. Select images you like to edit and show interesting effects.

Task 3 (10 points)
Repeat task 2a for color images. You have to process R, G, B components separately.

Task 4 (15 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.