**CSCE 689 Computational Photography**

**Report on Assignment 3**

# Overview

The goal of the project was to perform image blending give a source image and its mask and a target image. This was achieved using two approaches: Pyramid blending and Poisson blending.

# Deliverables

The contents of the submission have the following:

|  |  |
| --- | --- |
| Code\ | Directory containing the python source files |
| Report\_430000753\_RizuJain.pdf | This report. |

# Setup

The assignment was developed in the following environment:

* Host OS: Windows 10
* IDE: Spyder (Python 3.7)

# Task 1: Pyramid Blending

This task is implemented in the function:

def PyramidBlend(source, mask, target)

The overall process and the functions that implement the subtasks are briefed in the following flow diagram:

To reduce the size of the image to build the gaussian pyramid, the following function is implemented:

def myDownsample(img\_in)

To expand the size of the image to build Laplacian pyramids and at the end collapse the images in the pyramid, the following function is implemented:

def myUpsample(img\_in)

Both the above functions deploy the cv2.pyrDown() / cv2.pyrUp() for the resizing and subsequent filtering and sampling to build the pyramid.

The results for this task are given in the [results section](#_Observations_&_Results).

# Task 2: Poisson Blending

The results for this task are given in the [results section](#_Observations_&_Results).

# Observations & Results

The following images depict the given source images, the target images and the results obtained in Task 1 (i.e. Pyramid blending of images) and Task 2(i.e. Poisson blending of images.)

|  |  |
| --- | --- |
| Source Image: | Target Image: |
|  |  |
| Pyramid Image Blending: | Poisson Image Blending |
|  |  |

|  |  |
| --- | --- |
| Source Image: | Target Image: |
|  |  |
| Pyramid Image Blending: | Poisson Image Blending |
|  |  |

|  |  |
| --- | --- |
| Surce Image: | Target Image: |
|  |  |
| Pyramid Image Blending: | Poisson Image Blending |
|  |  |

|  |  |
| --- | --- |
| Source Image: | Target Image: |
|  |  |
| Pyramid Image Blending: | Poisson Image Blending |
|  |  |

|  |  |
| --- | --- |
| Source Image: | Target Image: |
|  |  |
| Pyramid Image Blending: | Poisson Image Blending |
|  |  |

|  |  |
| --- | --- |
| Source Image: | Target Image: |
|  |  |
| Pyramid Image Blending: | Poisson Image Blending |
|  |  |

|  |  |
| --- | --- |
| Source Image: | Target Image: |
|  |  |
| Pyramid Image Blending: | Poisson Image Blending |
|  |  |

|  |  |
| --- | --- |
| Source Image: | Target Image: |
|  |  |
| Pyramid Image Blending: | Poisson Image Blending |
|  |  |

The following example is taken externally. The mask image is also shown:

|  |  |
| --- | --- |
| Source Image: | Target Image: |
|  |  |
| Mask Image: | |
|  | |
| Pyramid Image Blending: | Poisson Image Blending |
|  |  |

Some inferences were drawn:

# References

1. <https://en.wikipedia.org/wiki/Discrete_Poisson_equation>
2. Patrick Pérez, Michel Gangnet, and Andrew Blake. 2003. Poisson image editing. ACM Trans. Graph. 22, 3 (July 2003), 313–318. DOI:https://doi.org/10.1145/882262.882269

~ End of Report ~