

## CSCE 689 Computational Photography

### Report on Assignment 5

#### I. Overview

The objective is to perform image retargeting using the Seam Carving technique.

#### II. Deliverables

The contents of the submission have the following:

Code\	Directory containing the python source file: main.py
Report_430000753_RizuJain.pdf	This report.

#### III. Setup

The assignment was developed in the following environment:

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

## IV. Main Task: Seam Carving Algorithm

This task is implemented in the function:

```
def SeamCarve (input, widthFac, heightFac, mask, usemask_flag):  
  
    return output, target_size
```

The algorithm is implemented in three parts:

- 1) computing the energy function,
- 2) finding optimal seam, and
- 3) removing the seam.

The three parts are repeated until the desired size is reached.

To handle the borders of the image, zero padding was done in the computation of energy function.

The following is the description of the input parameters:

- *input*: the input image
- *widthFac*: the resizing factor of the width
- *heightFac*: the resizing factor of the height
- *mask*: the mask of the image with required attributes
- *usemask\_flag*: flag which states if the mask is to be used or not




In the main task of seam carving on the given three images (*image\_01.jpg*, *image\_02.jpg* and *image\_03.jpg*), the mask is not used in the algorithm and the flag is False in the calling function of the driver code.

For [the fourth image](#) (*image\_04.jpg*), the mask is provided, and the flag is set to True. The images are saved with the suffix tag '*\_mask*.' For comparison, the result of seam carving without the use of mask is also added.



The [results for the fifth image](#), which is an additional example (*image\_05.jpg*) demonstrate a failure case of the seam carving. It distorts the main features of the image. For comparison, the results of image rescaling is also shown.

## Results




### 1. Image 1

Original Image	
	
Height Halved	Width Halved
	


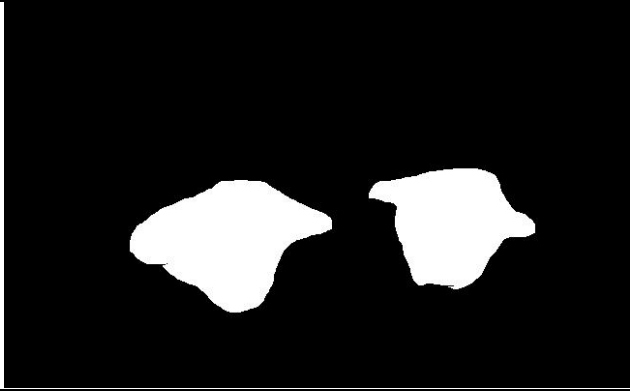




## 2. Image 2

Original Image	
	
Height Halved	Width Halved
	

### 3. Image 3



Original Image	
	
Height Halved	Width Halved
	

4. Extra Credit: Image 4

Original Image	Mask
	
Height Halved (With Mask)	Width Halved (With Mask)
	
Height Halved (Without Mask)	Width Halved (Without Mask)
	



## 5. Failure Case: Image 5

Original Image	
	
Height Halved by Image Rescaling	Width Halved by Image Rescaling
	
Height Halved by Seam Carving	Width Halved by Seam Carving
	

## V. References

- i. Shai Avidan and Ariel Shamir. 2007. Seam carving for content-aware image resizing. In ACM SIGGRAPH 2007 papers (SIGGRAPH '07). Association for Computing Machinery, New York, NY, USA, 10–es. DOI:<https://doi.org/10.1145/1275808.1276390>
- ii. [https://en.wikipedia.org/wiki/Seam\\_carving](https://en.wikipedia.org/wiki/Seam_carving)

~ End of Report ~