**ARI2129 Assignment**

***Part 1***

***Implementation***

***Evaluation***

Comparison of two images is performed using a function that calculates the error score based on a specified metric. The two metrics used are Sum of Squared Distance (SSD) and Mean Squared Error (MSE).

The blended image is compared with the image with two objects (S2) using both error metrics. A lower error value signifies that the blended image resembled the actual image S2 more.

|  |  |  |
| --- | --- | --- |
| **Filter** | **SSD** | **MSE** |
| None | 185244013 | 1329 |
| Gaussian | 185525091 | 1333 |
| Histogram Equalisation | 186486483 | 2616 |
| Median Blur | 185400136 | 1325 |

The image with the best SSD score used the object without applying any sort of filtering. The image with the best (i.e. lowest) MSE score used the object with median blur filtering. The image which did not use filtering had a very similar MSE score however the median blur image surpassed it slightly.

***Part 2***

***Implementation***

[Section ta Fran]

***Evaluation***

As with the tasks in Part 1, the SSD and MSE error metrics are used in evaluation.

6 different sets of images are used in task A. Using both the Telea and NS inpainting functions in the OpenCV library, an object is removed from the scene with two objects S2. The inpainted images are then compared with actual image with one object S1. The results are displayed in figure X.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Telea** | | **NS** | |
| **Set** | **SSD** | **MSE** | **SSD** | **MSE** |
| Statues | 115180351 | 455 | 115914723 | 511 |
| Shot Glasses | 33363637 | 59 | 33704007 | 59 |
| Academic Books | 59162597 | 327 | 61476765 | 383 |
| Footwear | 44000379 | 68 | 46650657 | 90 |
| Mugs | 38383500 | 75 | 40576761 | 84 |
| Technology | 38996685 | 118 | 40382590 | 145 |

The highlighted records are the lowest error score for each image set. A lower score indicates that that algorithm was better at inpainting an object out of an image.

Using the Telea technique provided the best scores for both metrics and hence resembled S1 greater than when using the NS technique.

Task B once again uses inpainting algorithms, this time over 6 sets of images with complex backgrounds obtained from the COTS Dataset. The results are displayed in figure Y.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Telea** | | **NS** | |
| **Set** | **SSD** | **MSE** | **SSD** | **MSE** |
| Food | 214050543 | 3573 | 214916338 | 3664 |
| Statues | 79180499 | 1738 | 79105387 | 1668 |
| Souvenirs | 73850406 | 2996 | 74686615 | 3077 |
| Academic Books | 93337891 | 3547 | 93754563 | 3476 |
| Cups | 125109291 | 902 | 125000973 | 899 |
| Electronics | 58630734 | 511 | 58714712 | 457 |