COMP 8505

Assignment 2 Report

Image Steganography

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Due: October 22nd 2300 hrs, 2021

Table of Contents

Secret Image

secret.bmp	

Cover Images

solid-colors.bmp	
sample_1920×1280.bmp	
sample_5184×3456.bmp	

Test Cases

Our test design considers different cover images to see if the stego image reveals any obvious artifacts. Initially, we will do a visual comparison between the two images to see if we are able to detect a change. After, we will use the Image Histogram Generator from sisik.eu/histo to statistically compare the distribution of colors before and after embedding the secret image.

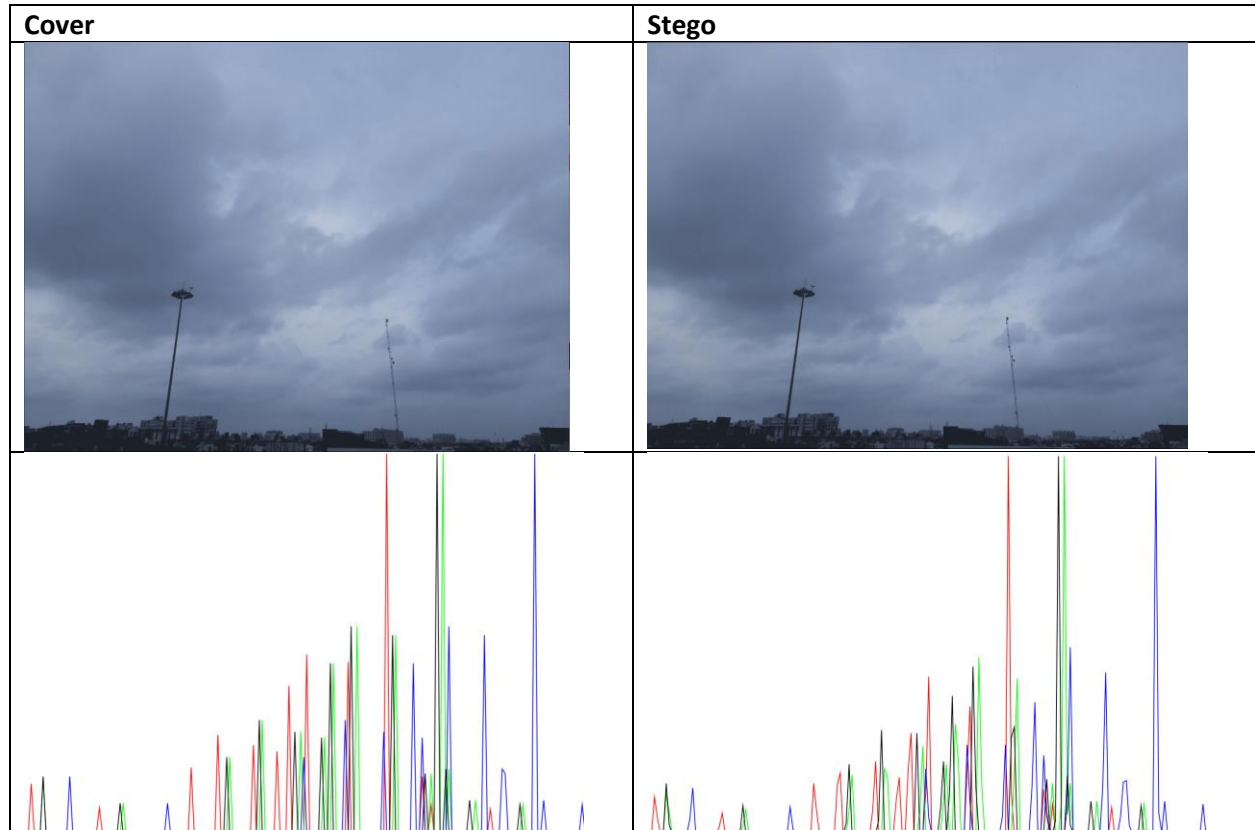| Case #	Test Description	Expected Result	Pass / Failed
1	Cover image with large sections of solid colors	Stego image is indifferentiable from cover image using our eyes. Histogram shows that stego image has more noise.	Pass
3	Cover image with lots of colors at a smaller resolution	Stego image is indifferentiable from cover image using our eyes. . Histogram shows that stego image has more noise.	Pass
4	Cover image with lots of colors at a higher resolution	Stego image is indifferentiable from cover image using our eyes. Histogram shows that stego image has more noise but less than the image with smaller resolution	Pass

Test Script

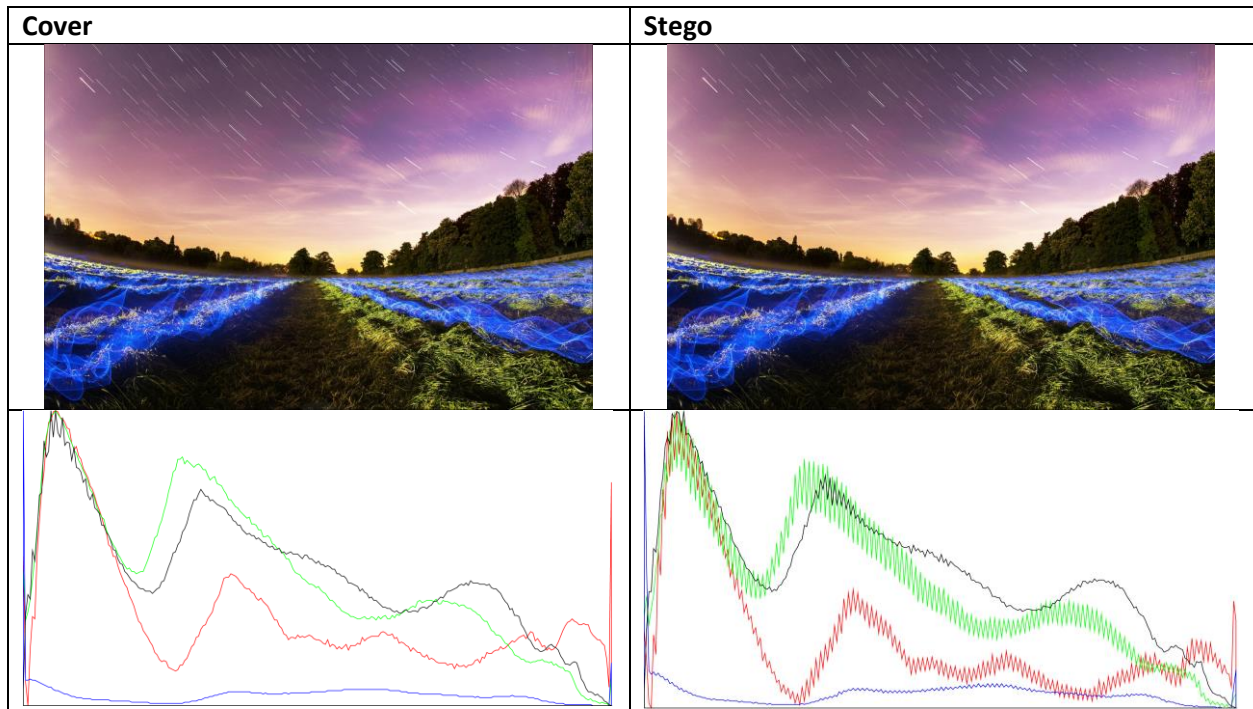Refer to the User Manual on how to execute the test script.

Test Results

Case 1

```
ubuntu@ubuntu2004:~/Desktop/BCIT/COMP_8505/Ass_2$ ./dcstego.py -c test_images/solid-colors.bmp test_images/secret.bmp stego_solid.bmp 123
-> success!
```
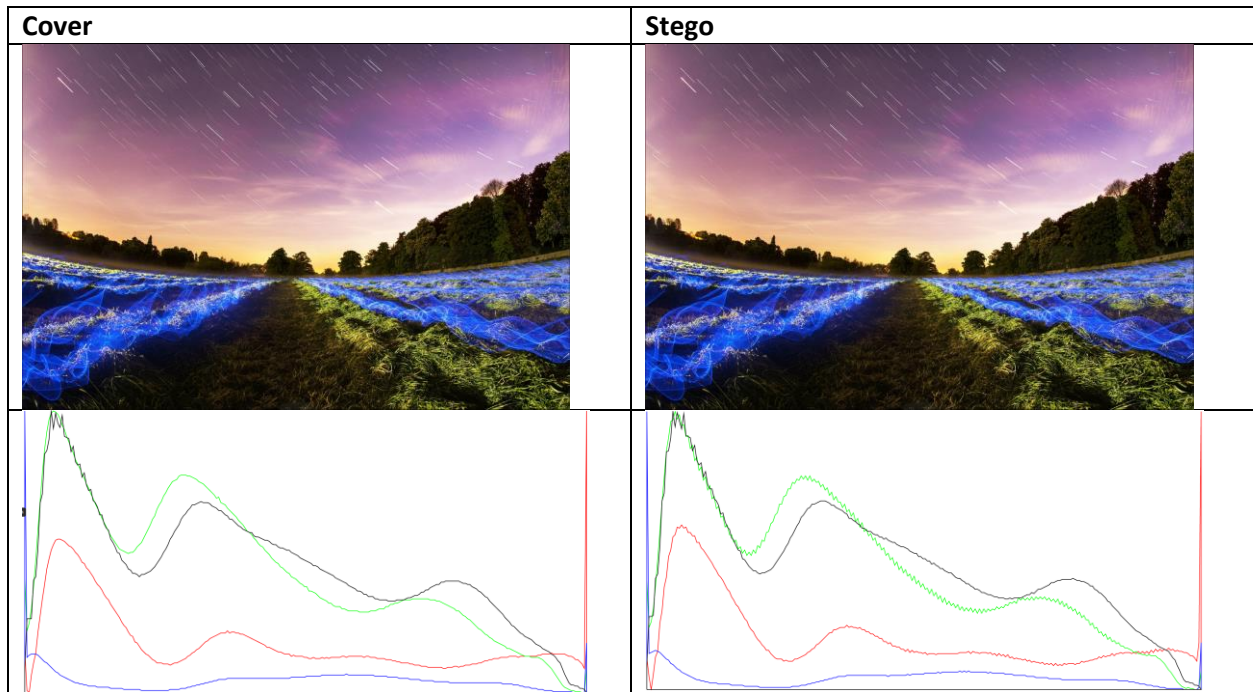
Cover	Stego

Case 2

```
ubuntu@ubuntu2004:~/Desktop/BCIT/COMP_8505/Ass_2$ ./dcstego.py -c test_images/sample_1920x1280.bmp test_images/secret.bmp stego_colors_low_res.bmp 123
-> success!
```

Cover	Stego

Case 3

```
ubuntu@ubuntu2004:~/Desktop/BCIT/COMP_8505/Ass_2$ ./dcstego.py -c test_images/sample_5184x3456.bmp test_images/secret.bmp stego_colors_high_res.bmp 123
-> success!
```

Cover	Stego

Conclusion

Based on the results, we observed that we were able to successfully embed our secret image inside a cover image to create a stego image. With the naked eye, we are not able to detect any changes to the original photo; however, we see that with lower bit rate photos, we can see that it introduces a lot of noise into the RGB histogram. To reduce the risk of being detected, use solid colors and high-resolution photos to mask the intent of the stego image further.