Digital Forensics Lab (Spring 2020)

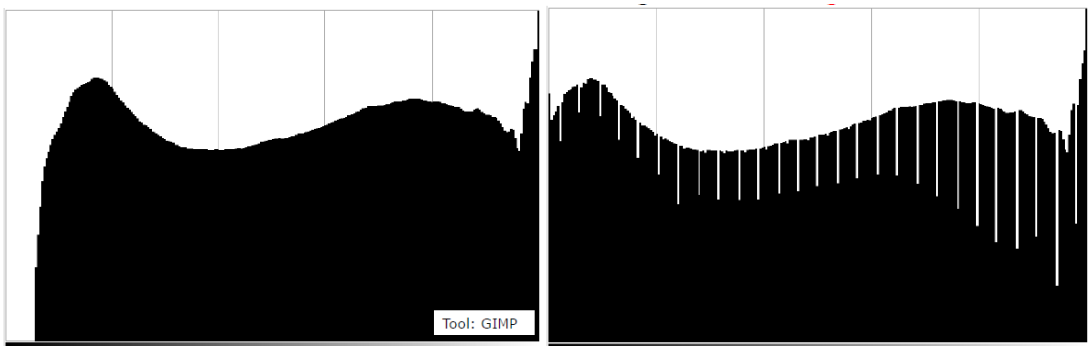
Assignment #3

Points: 20 + 10 + 20

Submission Deadline: 24-01-2020 (4:30 PM)

Histogram analysis for color manipulation: Histograms can be simple but effective tool to detect color manipulation. Image pixels are often manipulated by the forgers to stake claim the ownership of an image or to destroy the watermark embedded by the original owner. By manipulating the colors of the pixels, the image is altered. This is typically done by selecting some random color value <R1, G1, B1> and replace the pixels with this color with another color value (R2, G2, B2>. This can be done for many color values in a single image. However, the effect of such change is not easily visible in the manipulated image. For example, in the below image, can you guess which picture is original?

The histograms of the images are shown below.



Design an algorithm to that will implant the above forgery in an original image and implement it. Also, with the help of programming, construct the color histograms of the original and manipulated images to detect such forgery. Also, write a separate function that will automatically analyze the histograms to find out the forged image.

Submission Guidelines:

1. Individual submission only. Plagiarism check will be done. In case, >15% match in the code is found with anyone else, both will be awarded equal amount of penalty.
2. You can discuss amongst yourselves, but final submission has to be an individual's implementation. The code will be tested in the lab.