Middle East Technical University Department of Computer Engineering

CENG 466

Fundamentals of Image Processing

Spring 2017-2018

Assignment 3

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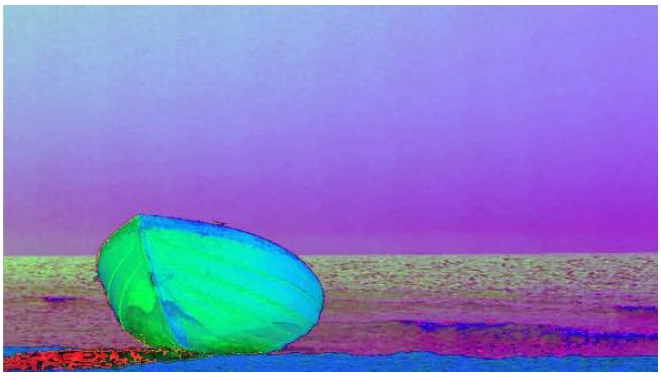
a.) Original Image



b.) Only Conversion RGB to HSV

c.) Distorted Image after some Permuting

A is the original image. **B** is the image converted **rgb** to **hsv** with m function. c is the corrupted image resulting from various rearrangements. When the **C** picture is obtained, the rgb values are rearranged to become grb values. Then hsv color space conversion process is done. Here, one channel is shifted to the other two channels leaving a patience. One of the displaced channels is L channel, while 'a' is channeled, while the other indicates brightness and makes the picture brighter.

Part 2 :

These are images that, **Figure 1** is Original**, Figure 2** is image which is added Salt & Peper Noise and **Figure 3** is image that is added Gaussian Noise.

Original image

Figure 1

Salt & Pepper Noise added

Figure 2

Gaussian Noise added

Figure 3

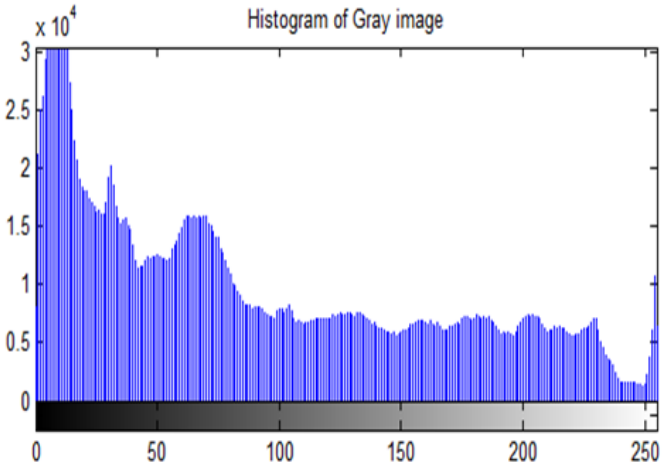


Figure 4

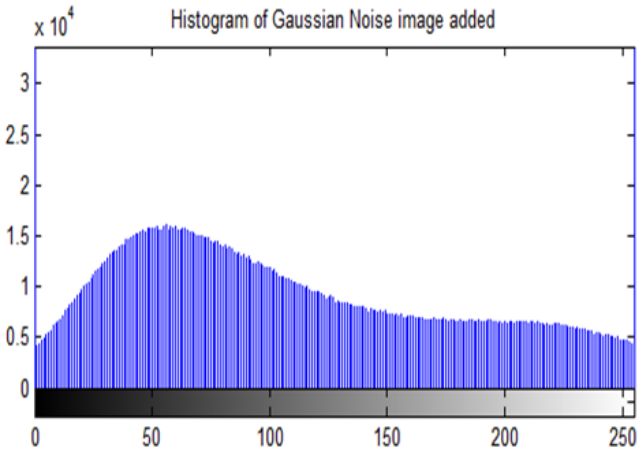


Figure 5

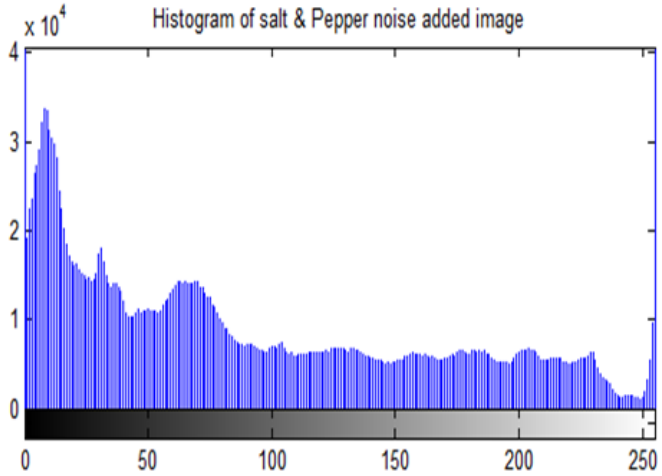


Figure 6

If we think a single pixel image that is added **Gaussian noise**, its's histogram is single bar of height 1. İmplementation of gaussian noise will move its bar to the left or to the right. If we'll do many experiments with given image and given distribution parameters we'll that in average bar moves on the distance which equals to mean of distribution.For a typical images, changes with gaussian noise image histogram similar to this - if histogram has any anomalies, they will move towards left or right for distribution mean points and effect of any anomaly will be slightly less sharp than on the original image.

You see in **Figure 5** a histogram of image with **Gaussian Noise**. The values in the histogram which represents the Gaussian Noisy Image are closer to each other than the Orijinal Image Histogram values in **Figure 4**.In other words, histogram of Original Image is sharper than histogram of Gaussian Noisy Image.On the other hand, the differecence I just mentioned

between **Figure 4** and **Figure 5**, not true between histogram of image with Salt&Pepper and Original Image but there are still small ruptures in **Figure 6.**

Color space defined by the CIE, based on one channel for Luminance (lightness) (L) and two color channels (a and b). In this model, the color differences which we notice correspond to distances when measured colorimetrically. The a axis extends from green (-a) to red (+a) and the b axis from blue (-b) to yellow (+b). The brightness (L) increases from the bottom to the top of the three-dimensional model.

I made a manipulation in this color space. I did not change the brightness, which is the (L) value but I changed the value that determines from green to red to the value that determines from blue to yellow. At first, before the permuting (a) has a high value while (b) has a low value. In this initial case the colors of red and blue are domitaned more in the image. After manipulation, yellow and green were more colors to greet us. The image is now brighter.