SPECIAL TASK

Task

Figure 1: Image Given for Special Task

The image given for special task is as given above. The task is to enhance the image. At first sight, it can be noticed that the image appears washed out. The colors seem to be very clustered around white region (upper bound of Red, Green and Blue layers resulting in a whitish nature).

Contrast Enhancement

Therefore, a contrast enhancement technique has to be applied to distribute colors more evenly among darker ranges as well. The application supports contrast enhancements by means of providing a naive scale, using histogram stretching and using histogram equalization. However, histogram equalization tries to equalize the color distribution in all ranges(Amarasinghe n.d.; Đurović n.d.) resulting in a more vivid high contrast image.

Once Contrast Enhancement using Histogram Equalization was applied, following image was obtained.

Figure 2: Special Task Image after Contrast Enhancement

though it highlights previously invisible detail in the image. However, this also appears to cause a slight blur/pixelation in the image.

Sharpening

Therefore, multiple sharpening techniques were applied separately to the contrast enhanced image since it wasn't possible to exactly predict which technique would produce the best result. All three sharpening methods supported (including Unsharp masking) rely on a 3x3 filter to determine edges and are not capable of taking the entire image into consideration when determining edges.

Figure 3: Special Task Image Sharpened with Sobel Filter

Sobel operator based sharpening proved to be extremely sensitive resulting in visible artifacts across the image reducing visibility.

Figure 4: Special Task Image Sharpened using Unsharp Masking

Figure 5: Special Task Image Sharpened using Laplacean Filter

Both laplacean based sharpening and unsharp masking based sharpening provided considerably improved image. However, laplacean based sharpening output gave more cleaner output.