

CS663: Fundamentals of Image Processing

Homework 2

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1 Question 5.

The Matlab script used to perform this question is HW2.Q9.mlx

Performing local histogram equalization is used to enhance the contrast of images by applying histogram equalization independently to small regions or neighborhoods within the image.

Here we applied equalization of neighbourhood sizes of 7x7, 31x31, 51x51 and 71x71 for two images the result of which are given in the images below.

The comments and conclusion that we can get from the given activity is:

- The local histograms work well for small features like leaves and small bushes, however they create noisy results for features which are stretched over long ranges, like sky and floor.
- For the first image we see false patterns on the sky that arise due to local distributions that do not match the distribution of intensities of the sky. We see the same in the top left of the forest image.
- We can also see that for very low size the result is almost like a noise, and as we increase the size and reach a value of 71 we get better images as it gives a good trade-off between local contrast and getting the overall structure of the image.

- In the first image the local equalization is able to produce contrast in the overlapped features in the left region of the image, in comparison to global image
- The local images are better for the second images where the contrast in the leaves and branches are highlighted more than for global equalization.

1.1 Local Histogram equalization of LC1 image



Figure 1: Size 7x7



Figure 2: Size 31x31



Figure 3: Size 51x51



Figure 4: Size 71x71

1.2 Local Histogram equalization of LC2 image



Figure 5: Size 7x7



Figure 6: Size 31x31



Figure 7: Size 51x51



Figure 8: Size 71x71

1.3 Global Histogram equalization

The Global Histogram equalization was done using the in-built function in Image Processing Toolbox of matlab : **histeq()**



Figure 9: Global Histogram equalization of LC1



Figure 10: Global Histogram equalization of LC2