

COMPUTER VISION(EC4047D)

ASSIGNMENT 5: RETINEX ALGORITHM

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1. Implementation of basic Retinex algorithm.

Algorithm:

- Consider a color image. Perform the low pass filtering on the input image. Here, for filtering I have used Gaussian kernel.
- Logarithm of the input image is found.
- Logarithm of the low pass filtered image is subtracted from the logarithm of input image.
- Now, the result is of the range of (0-1). So, we need to scale it by a factor and map it to the range (0-255).

Here, I applied the algorithm for the r b g channels separately and combined it to form the final image.

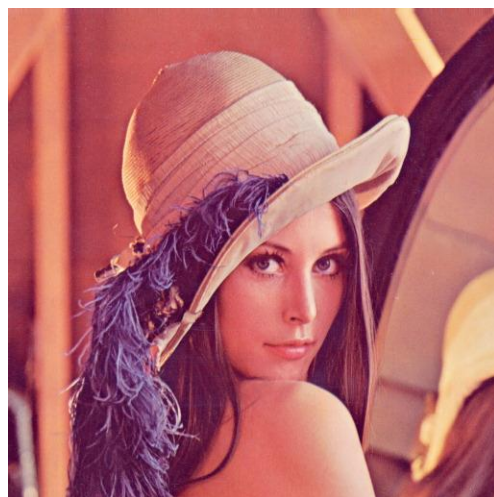
Observation:

- Hence it is observed that we obtain a better contrast image but there will be some loss in the color components.
- Using this method, i.e. the Single scale retinex we obtain the dynamic range compression and color independence from the spectral distribution of the scene illuminant.
- But the lightness rendition is not obtained so we go for Multi scale retinex.
- On varying the variance value, it is observed that with higher 'c' value more components of the color are lost.

Output:



Image after Single scaled retinex



Original Image

2. Implementation of Multi-Scale Retinex.

Algorithm:

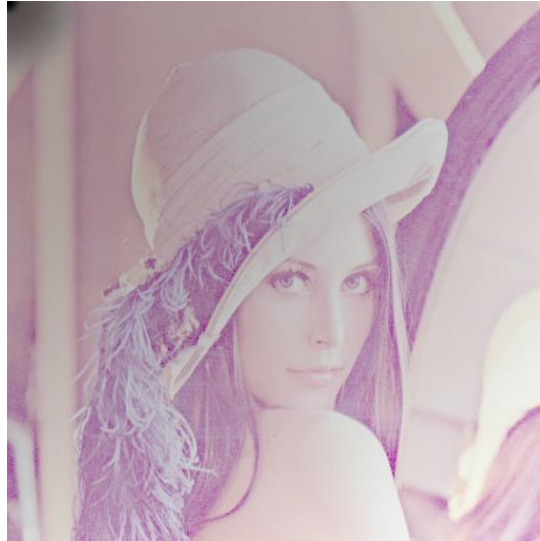
- For MSR, the same algorithm of SSR is followed with different values of 'c' in gaussian filter.
- Then, the resultant of each iteration is to be scaled by some factor 'x' for all the cases (different values of C). I took x as 1/3.
- Now, we need to combine these results to get the MSR output.

$$Fn(x, y) = Ke^{-\frac{r^2}{c^2}}$$

- I found for different variances say (5,30 and 300).



Original Image



MSR image

3. Implementation of Multi-Scale Retinex with color retention.

Algorithm:

- To reduce the increased loss of color information during MSR we use MSRCR.