COMPUTER VISION

Assignment 3

1) Median filter,
2) Adaptive median filter,
3) Homomorphic filter

Submitted By:
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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:

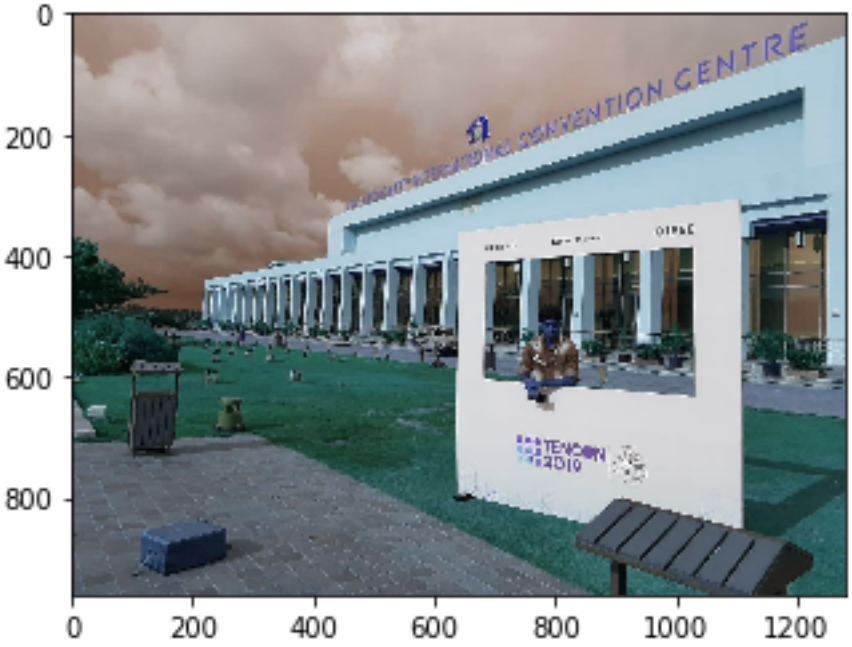
- Hence it is observed that we obtain a better contrast image but there will be
  some loss in the color components.

- 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.

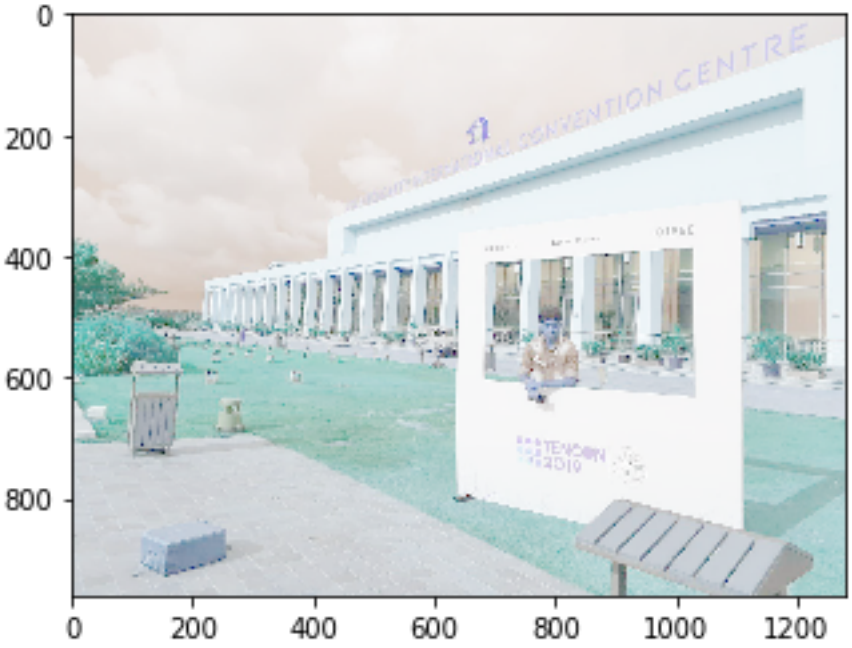
- But the lightness rendition is not obtained so we go for Multi scale retinex.

- On varying the variance value, it is observed that with higher ‘c’ value more
  components of the color are lost.

Input:



Output:



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. $_r{}^2$

  $Fn(x, y) = Ke^{-c^2}$
- I found for different variances say (5,30 and 300).