Assignment2 Report Q3

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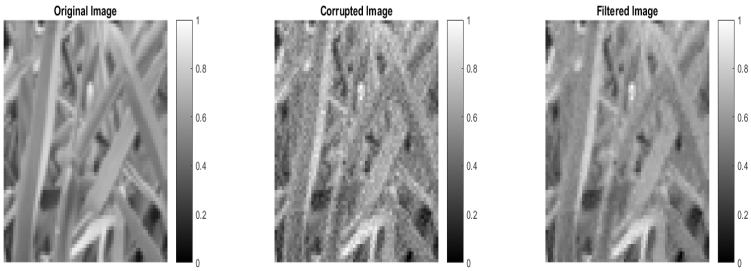
In the equation of weights,

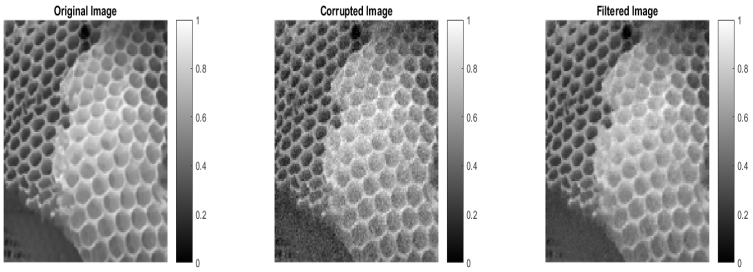
$$w_h(j,k) = \frac{exp(-\frac{||f(R_j)-f(R_k)||^2}{h^2})}{\sum_{j\in\Lambda} \exp(-\frac{||f(R_j)-f(R_k)||^2)}{h^2}}$$

Filtered Intensity = $\sum_{j\in\Lambda} w_h(j,k)f(j)$

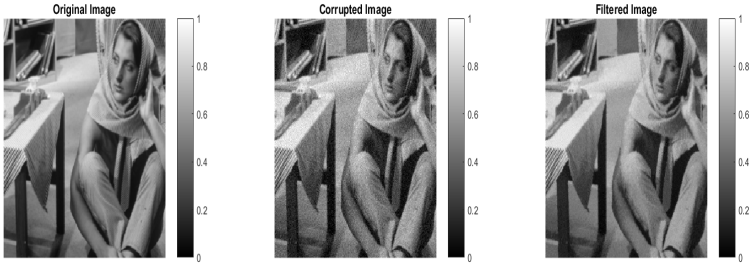
- The optimal parameter we found for h (or) σ^* is 0.1 and optimal RMSD(Root mean squared difference) is 0.0321, 0.0314, 0.0 respectively for *grass*, *honeyCombReal*, *barbara* figures.
- We used a Gaussian distribution centered at the center pixel of patch of 9∗9, and standard deviation 1 on the patches to make it more isotropic.
- RMSD values for filtered images (in a single run)
  Grass:
  h = 0.0900(0.9 σ^*) RMSD = 0.0321
  h = 0.1100(1.1 σ^*) RMSD = 0.0326
  h = 0.1000(σ^*) RMSD = 0.0321
  honeyCombReal:
  h = 0.0900(0.9 σ^*) RMSD = 0.0320
  h = 0.1100(1.1 σ^*) RMSD = 0.0312
  h = 0.1000(σ^*) RMSD = 0.0314
  barbara:
  h = 0.0900(0.9 σ^*) RMSD = 0.0282
  h = 0.1100(1.1 σ^*) RMSD = 0.0268
  h = 0.1000(σ^*) RMSD = 0.0273
  These above written values may change as the noise we add, as the randn would change. In most of cases run, we found $\sigma^* = 0.1$ giving less RMSD than other two.
- Time taken: For the *grass* figure, it takes around 30 seconds to generate the output.
  For the *honeyCombReal* figure, it takes 90 around seconds to generate the output.
  For the *barbara* figure, it takes around 400 seconds to generate output.
- **Grass:**



- **Honey:**



- **Barbara:**



- **Gaussian with center at (0,0) and $\sigma = 1$:**