CS 663 - Fundamentals of Digital Image Processing
Assignment 2

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1 Patch Based Filtering

For a patch size of 9 and window size of 25, we use padding as the boundary condition. A Gaussian filter with variance = 1.5 has been used for all the images except barbara for which the gaussian filter had variance = 0.66. For the barbara image we have used a downsampling factor of 2

1.1 Barbara Image

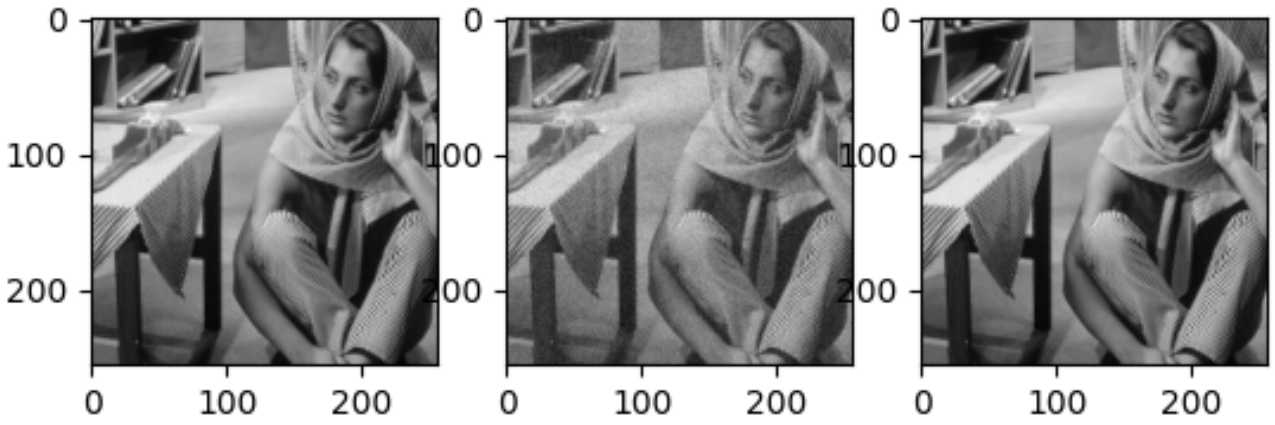

Figure 1: For barbara.png

Optimal Parameters
$\sigma_{intensity} = 0.15$
Optimal RMSD for filtered image = 0.05435

Other RMSD values:

(i) $0.9\sigma^*_{intensity} : RMSD = 0.05528$

(ii) $1.1\sigma^*_{intensity} : RMSD = 0.05491$

1.2 Honeycomb Image

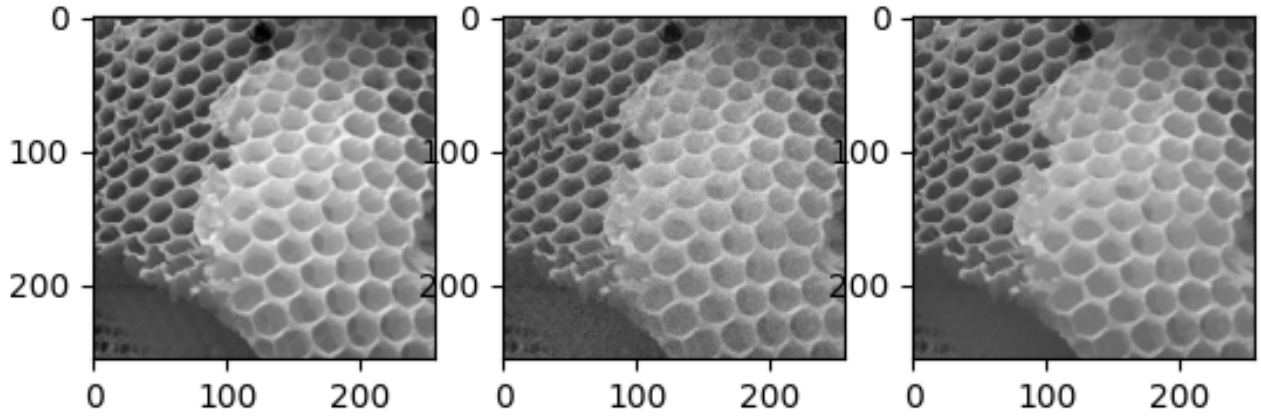

Figure 2: For honeyCombReal.png

Optimal Parameters
$\sigma_{intensity} = 0.16$
Optimal RMSD for filtered image = 0.03004356

Other RMSD values:

(i) $0.9\sigma^*_{intensity} : RMSD = 0.030713$

(ii) $1.1\sigma^*_{intensity} : RMSD = 0.030945$

1.3 Grass Image

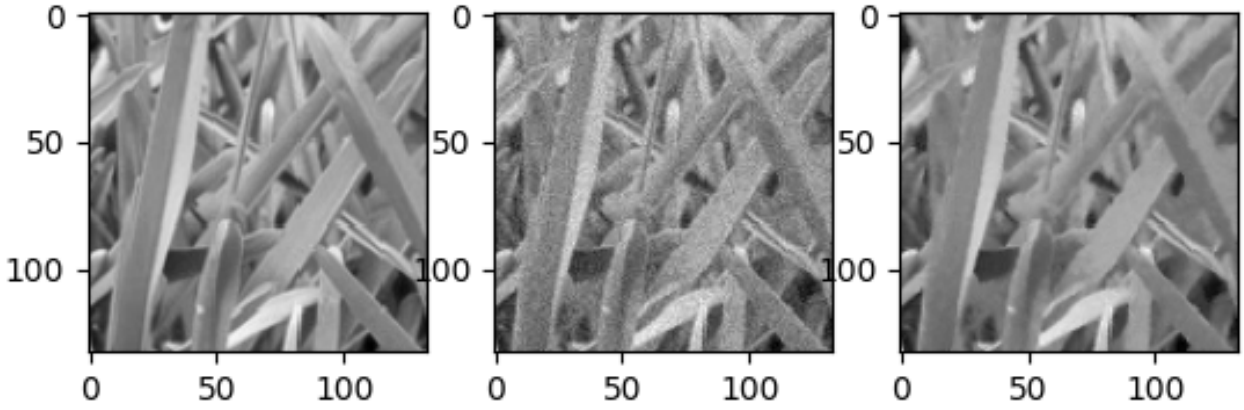

Figure 3: For grass.png

Optimal Parameters
$\sigma_{intensity} = 0.14$
Optimal RMSD for filtered image = 0.0285936

Other RMSD values:

(i) $0.9\sigma^*_{intensity} : RMSD = 0.0291534$

(ii) $1.1\sigma^*_{intensity} : RMSD = 0.0295837$

1.4 Gaussian Mask

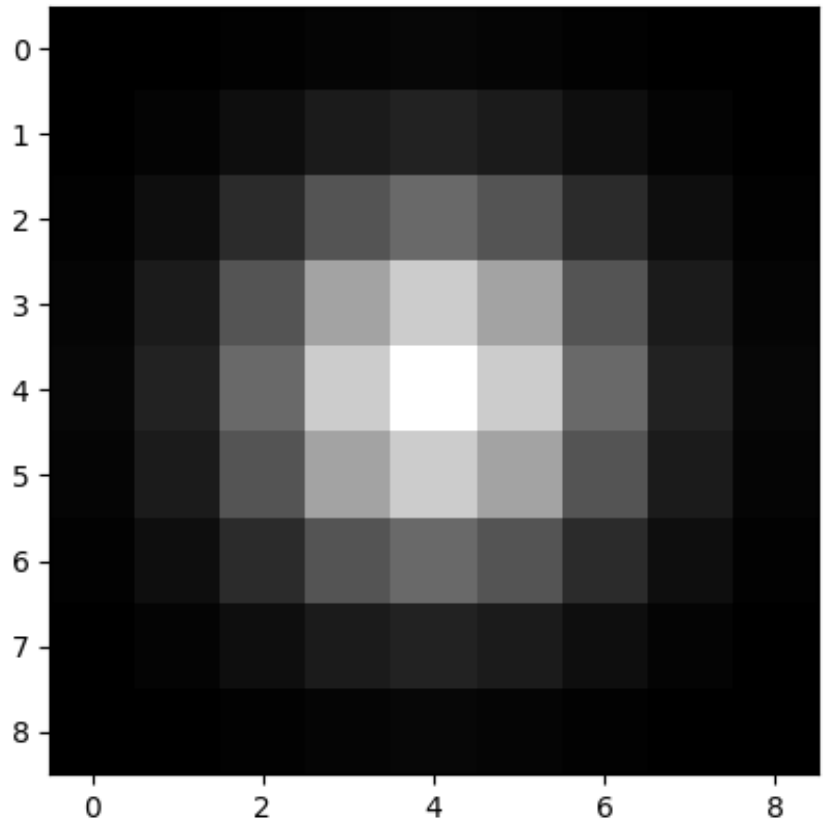

Figure 4: Gaussian Mask for all images