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# Question 3

## 3.1 Isotropic Gaussian Mask

We used a gaussian mask of $\sigma = 1.5$ to make the patches isotropic.

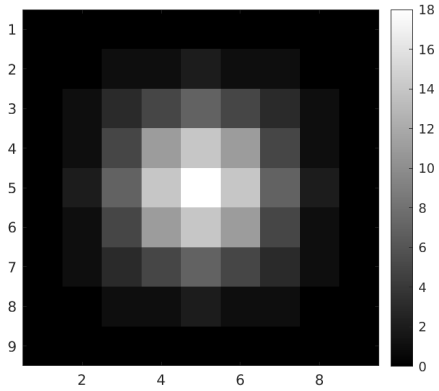


**Figure 3.1:** Gaussian Mask

## 3.2 Patch Based Filtering on barbara.png

The optimal filtering for barbara.png was attained at $\sigma_{barbara} = 0.8424$.
The RMSD values are:

- $\text{RMSD}_{\sigma} = 2.614193$
- $\text{RMSD}_{0.9\sigma} = 2.669242$
- $\text{RMSD}_{1.1\sigma} = 2.636064$

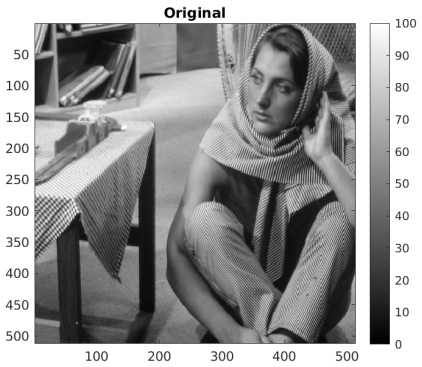


**Figure 3.2(a):** Original

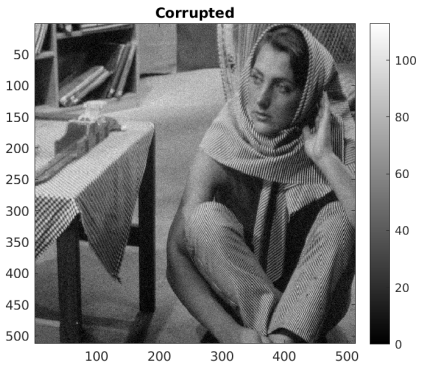


**Figure 3.2(b):** Corrupted

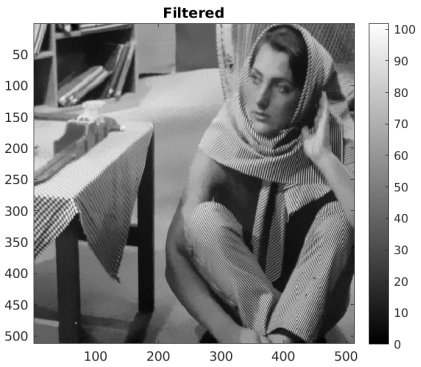


**Figure 3.2(c):** Filtered

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## 3.3 Patch Based Filtering on grass.png

The optimal filtering for barbara.png was attained at $\sigma_{grass} = 1.81$.
The RMSD values are:

- $\text{RMSD}_{\sigma} = 7.265757$
- $\text{RMSD}_{0.9\sigma} = 7.303963$
- $\text{RMSD}_{1.1\sigma} = 7.520618$

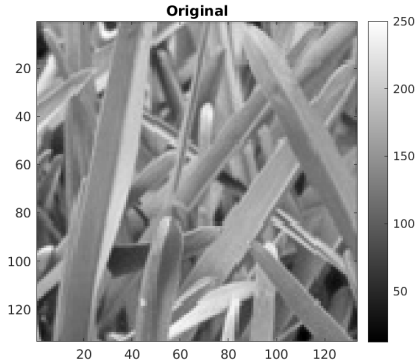


**Figure 3.3(a):** Original

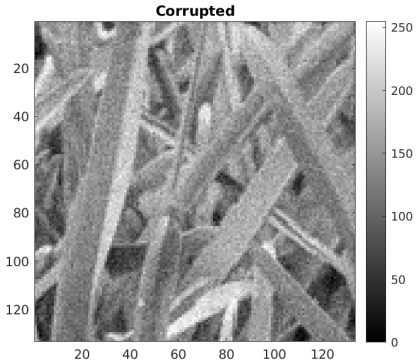


**Figure 3.3(b):** Corrupted

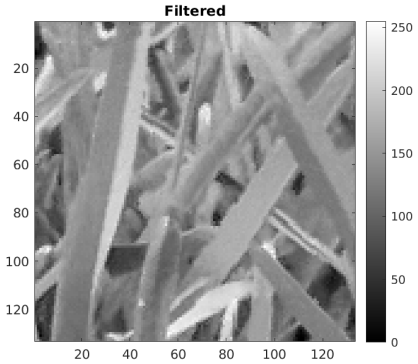


**Figure 3.3(c):** Filtered

## 3.4 Patch Based Filtering on beehive.png

The optimal filtering for barbara.png was attained at $\sigma_{beehive} = 2.1$.
The RMSD values are:

- $\text{RMSD}_{\sigma} = 7.432849$
- $\text{RMSD}_{0.9\sigma} = 7.578823$
- $\text{RMSD}_{1.1\sigma} = 7.559053$

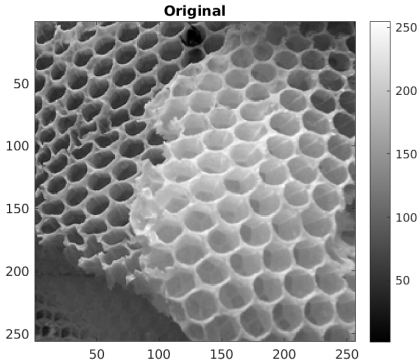


**Figure 3.4(a):** Original

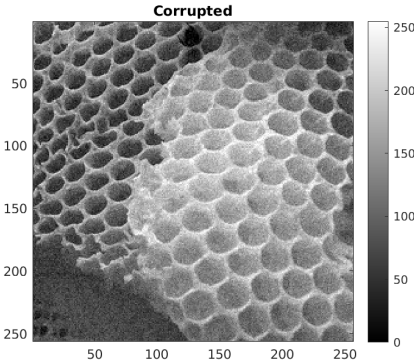


**Figure 3.4(b):** Corrupted

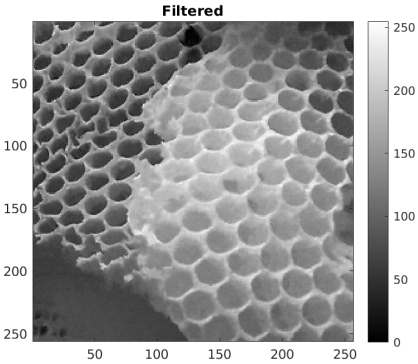


**Figure 3.4(c):** Filtered