

### Q3 Edge-preserving Smoothing using Patch-Based Filtering.

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#### Report:

Resized the image by subsampling by a factor of 2 along each dimension, after applying a Gaussian blur of standard deviation around 0.66 pixel width.

Window Size = 25\*25

Patch size = 9\*9

Here are the results for `sigmaSpatial` = 1.4 and `sigmaIntensity` = 1.08:



Figure 1: Original, corrupted and filtered images.



Figure 2: Mask used to make patches isotropic.

**Optimal parameter** values are as follows:

`sigmaSpatial` = 1.4

`sigmaIntensity` = 1.08

RMSD for the optimal parameter is 0.0394

RMSD for  $1.1 * \sigma = 0.406$

RMSD for  $0.9 * \sigma = 0.145$