Assignment 2: CS 736, Algorithms for Medical Image Processing

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Part (a)

The RRMSE between the noisy and noiseless images is 0.3725.

Part (b)

Prior Type	a*	b*	τ	$\mathcal{R}(a*, b*)$	$\mathcal{R}(1.2a*, b*)$	$\mathcal{R}(0.8a*, b*)$	$\mathcal{R}(a*, 1.2b*)$	$\mathcal{R}(a*, 0.8b*)$
Quadratic	0.995	-	0.1	0.0222	0.0231	0.1482	-	-
Huber	0.99	15	0.1	0.0222	0.0231	0.0277	0.0222	0.0222
Disc-adapt	0.55	0.0001	0.796	1.07e-4	0.0028	2.63e-4	1.1e-4	1.1e-4

The Huber function's results become insensitive to gamma after a threshold. Note that RRMSE in case of $a = 1.2a*$ has been evaluated at $a = 1$ if $1.2a* > 1$.

Part (c)

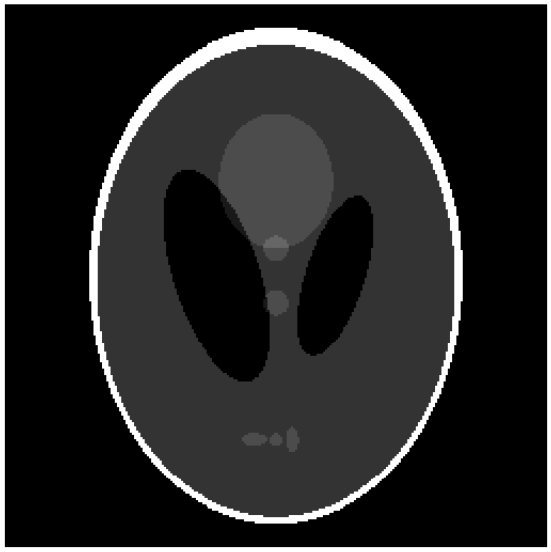
Figure 1: Noiseless image

Figure 2: Noisy image

Figure 3: Quadratic-denoised image

Figure 4: Huber-denoised image

Figure 5: Discontinuity-adaptive denoised image



Part (d)

Figure 6: Quadratic-denoised objective function

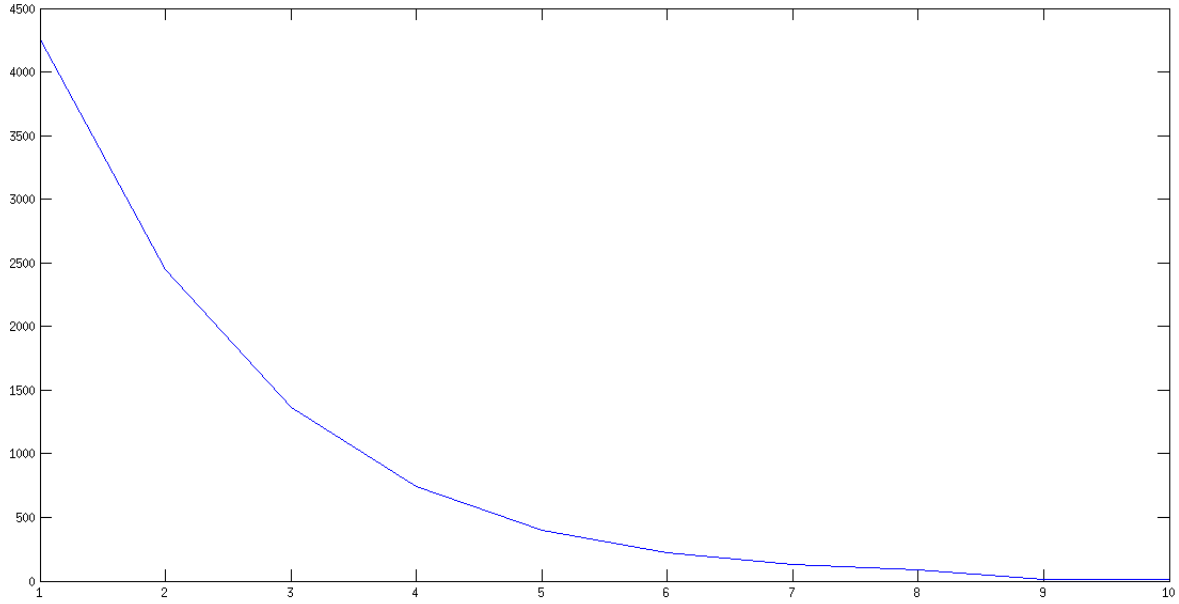


Figure 7: Huber-denoised objective function

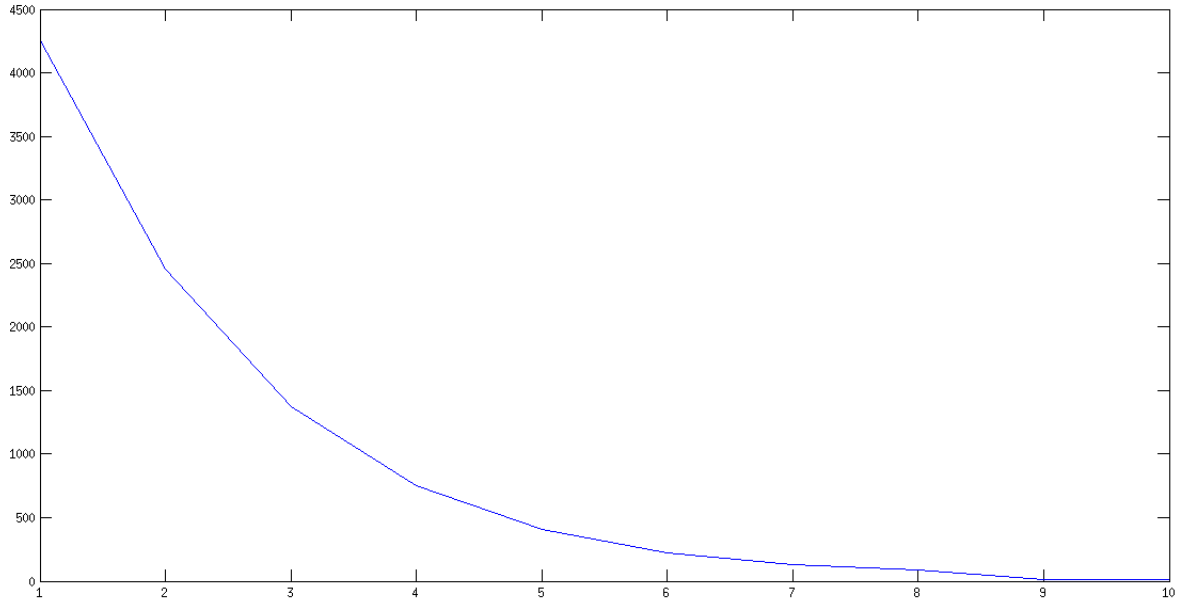


Figure 8: Discontinuity-adaptive denoised objective function