Assignment 3.1

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(a)

RRMSE Between Noisy and Noiseless Image

$$RRMSE = 0.2612$$

(b)

Quadratic Prior

- Optimal α is 0.0005
- RRMSE ar α is $2.438248e-01$
- RRMSE at 0.8α is $2.438240e-01$
- RRMSE at 1.2α is $2.501484e-01$
- γ does not affects the quadratic prior

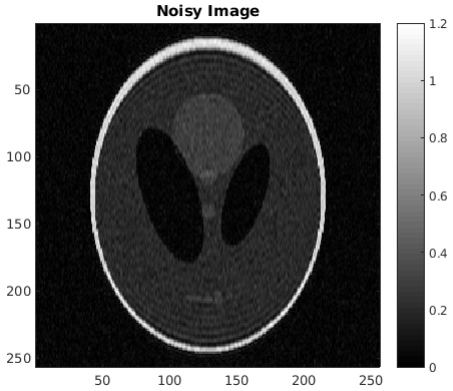
Huber Prior

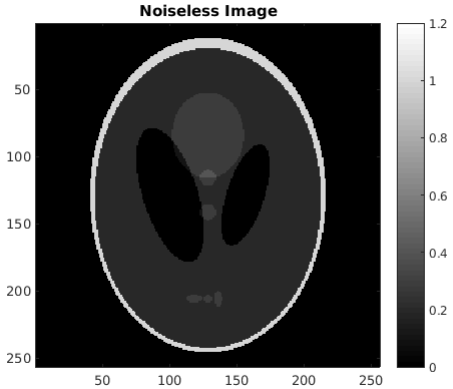
- Optimal α is 0.00005 and γ is 0.23
- RRMSE ar α and γ is $2.368141e-01$
- RRMSE at 0.8α and γ is $2.368141e-01$
- RRMSE at 1.2α and γ is $2.370435e-01$
- RRMSE at α and 0.8γ is $2.372921e-01$
- RRMSE at α and 1.2γ is $2.372365e-01$

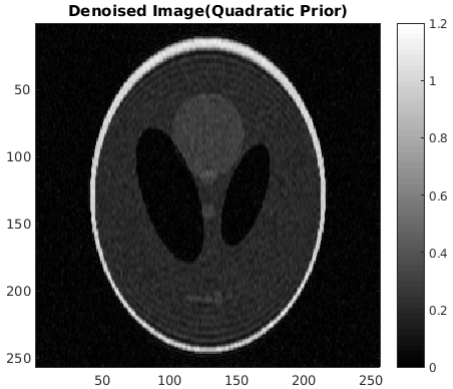
Discontinuity-adaptive Prior

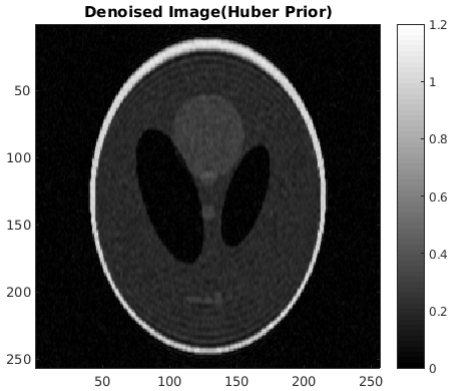
- Optimal α is 0.000006 and γ is 0.04
- RRMSE ar α and γ is $1.990510e-01$
- RRMSE at 0.8α and γ is $1.997076e-01$
- RRMSE at 1.2α and γ is $2.003708e-01$
- RRMSE at α and 0.8γ is $1.985012e-01$
- RRMSE at α and 1.2γ is $2.006748e-01$

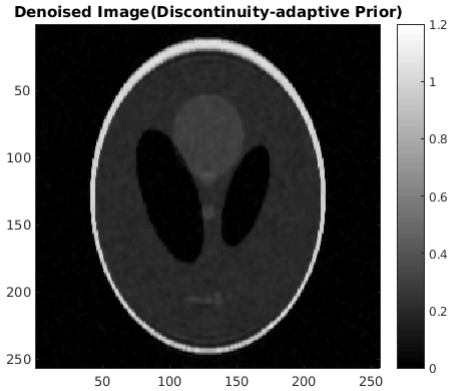
(c)


Noisy Image
50
100
150
200
250
50
100
150
200
250
1.2
1
0.8
0.6
0.4
0.2
0

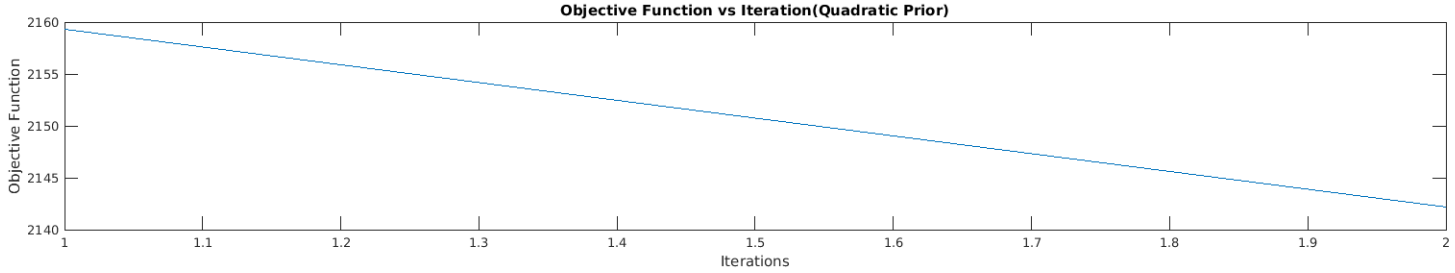

Noiseless Image
50
100
150
200
250
50
100
150
200
250
1.2
1
0.8
0.6
0.4
0.2
0

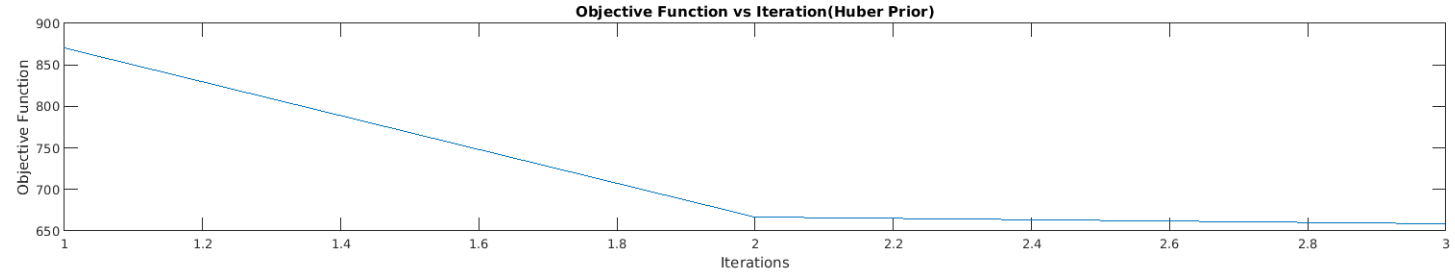

Denoised Image(Quadratic Prior)
50
100
150
200
250
50
100
150
200
250
1.2
1
0.8
0.6
0.4
0.2
0

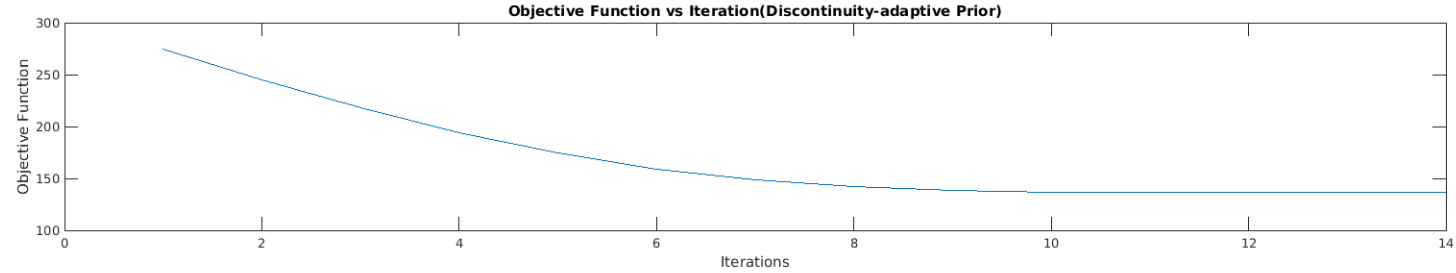

Denoised Image(Huber Prior)
50
100
150
200
250
50
100
150
200
250
1.2
1
0.8
0.6
0.4
0.2
0


Denoised Image(Discontinuity-adaptive Prior)
50
100
150
200
250
50
100
150
200
250
1.2
1
0.8
0.6
0.4
0.2
0

(d)


Objective Function vs Iteration(Quadratic Prior)
Objective Function
Iterations
2160
2155
2150
2145
2140
1
1.1
1.2
1.3
1.4
1.5
1.6
1.7
1.8
1.9
2


Objective Function vs Iteration(Huber Prior)
Objective Function
Iterations
900
850
800
750
700
650
1
1.2
1.4
1.6
1.8
2
2.2
2.4
2.6
2.8
3


Objective Function vs Iteration(Discontinuity-adaptive Prior)
Objective Function
Iterations
300
250
200
150
100
0
2
4
6
8
10
12
14