Assignment 3.1

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(a)

RRMSE Between Noisy and Noiseless Image

$$RRMSE = 0.3364$$

(b)

Quadratic Prior

- Optimal α is 0.8
- RRMSE ar α is 0.2168
- RRMSE at 0.8α is 0.2272
- RRMSE at 1.2α is 0.2668
- γ does not affects the quadratic prior

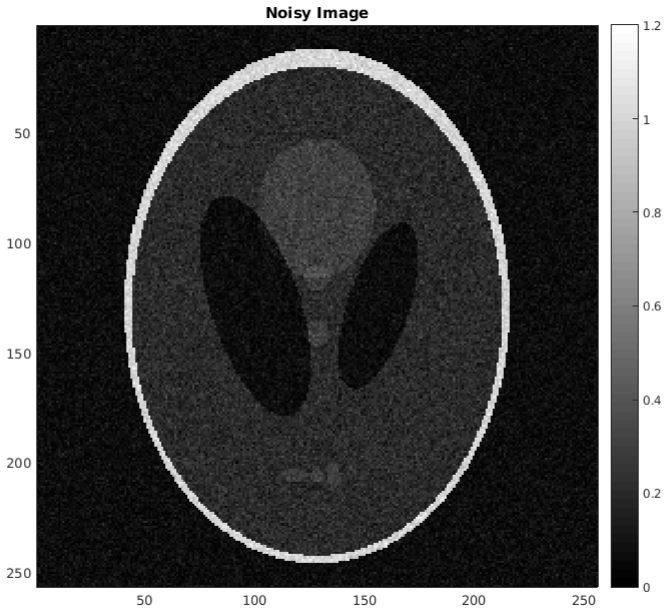
Huber Prior

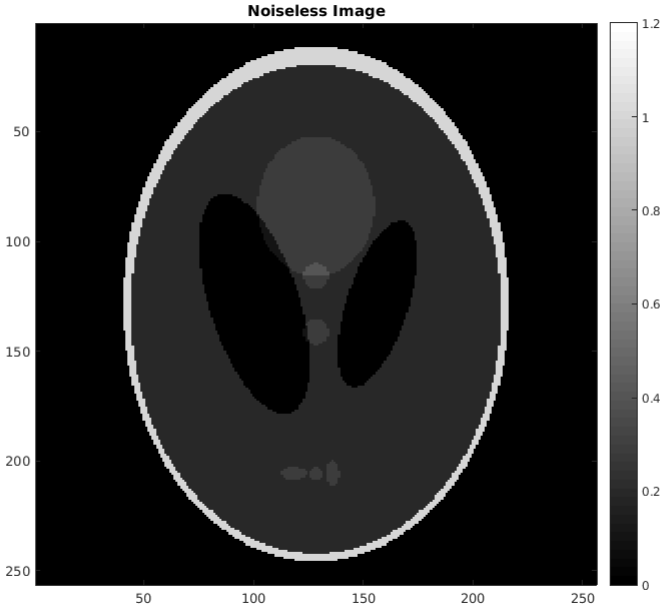
- Optimal α is 0.503 and γ is 0.0424
- RRMSE ar α and γ is 0.1568
- RRMSE at 0.8α and γ is 0.1623
- RRMSE at 1.2α and γ is 0.1629
- RRMSE at α and 0.8γ is 0.1583
- RRMSE at α and 1.2γ is 0.1578

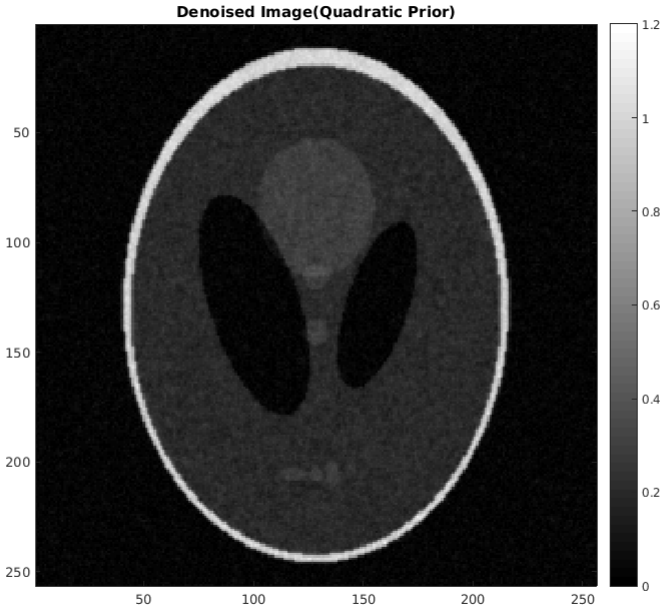
Discontinuity-adaptive Prior

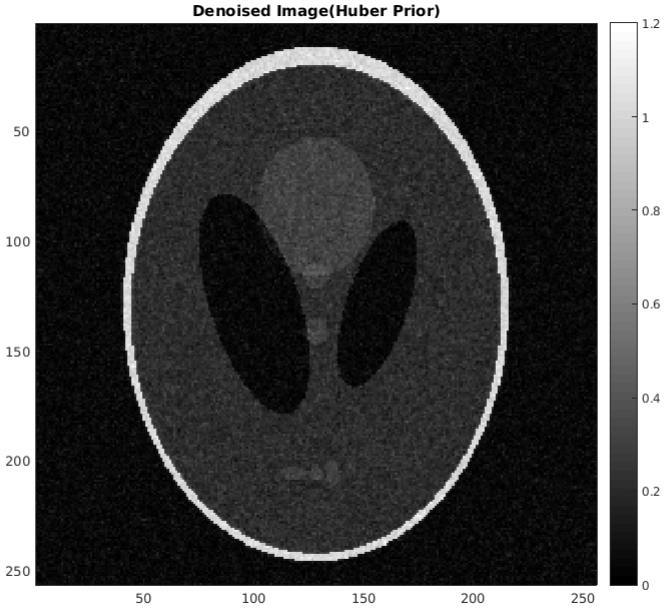
- Optimal α is 0.005 and γ is 0.0011
- RRMSE ar α and γ is 0.06926
- RRMSE at 0.8α and γ is 0.06930
- RRMSE at 1.2α and γ is 0.06961
- RRMSE at α and 0.8γ is 0.06961
- RRMSE at α and 1.2γ is 0.06954

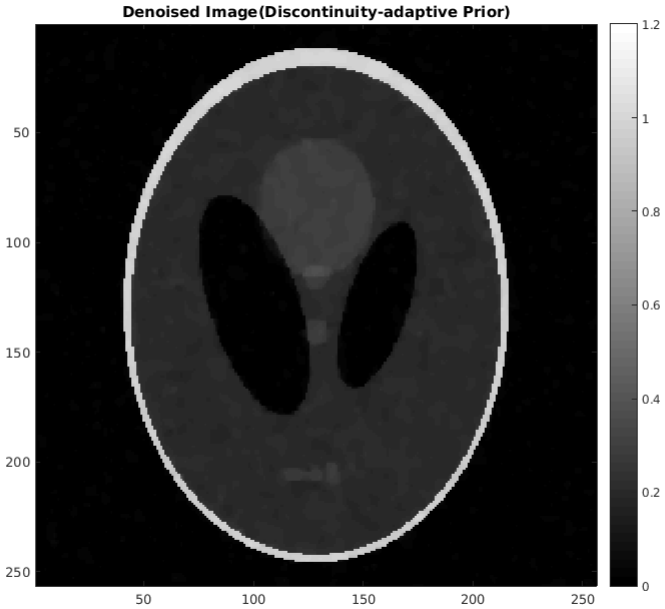
(c)


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

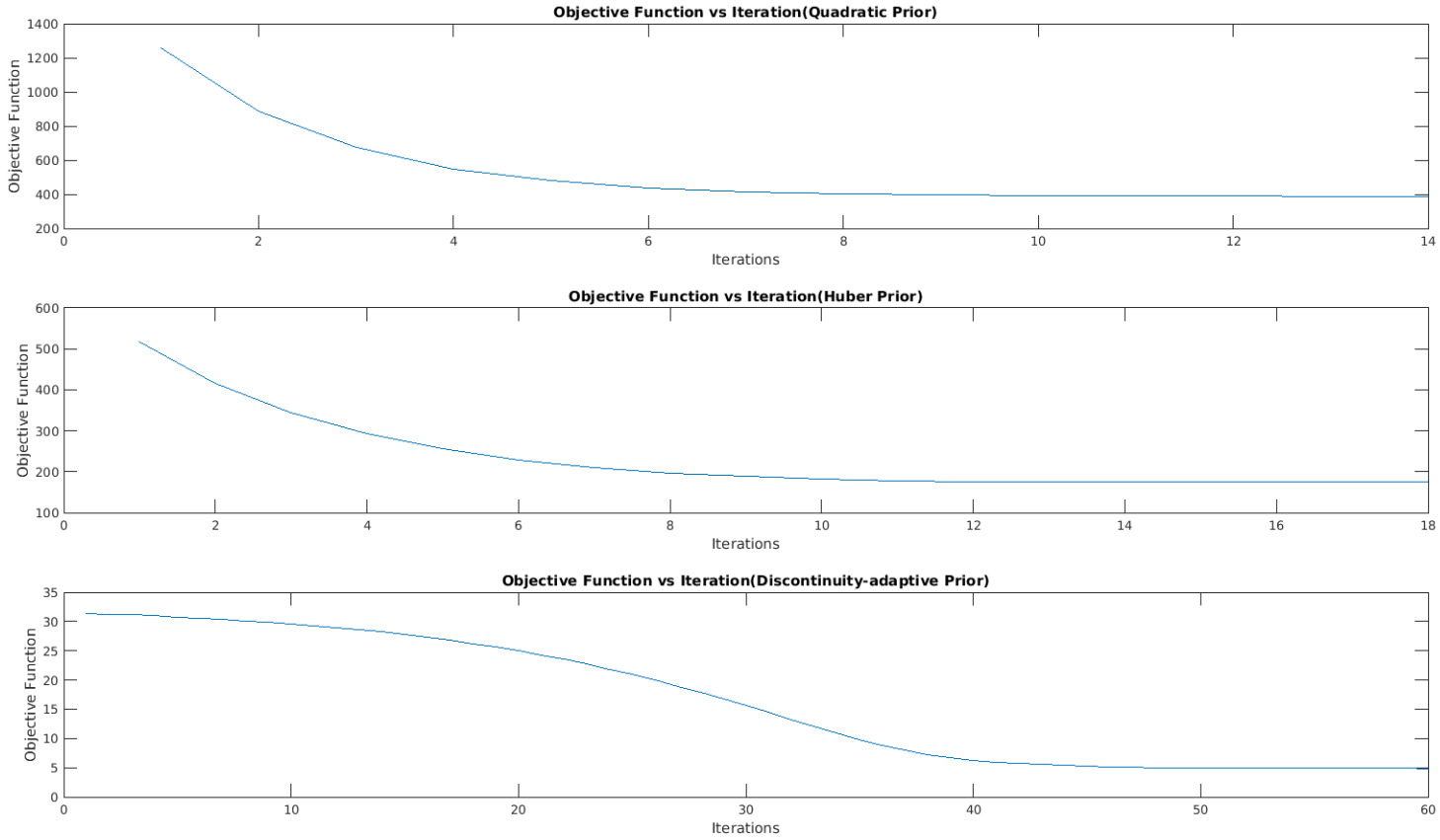

Noiseless Image
50
100
150
200
250
50
100
150
200
250
1.2
1
0.8
0.6
0.4
0.2
0


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
1400
1200
1000
800
600
400
200
0
2
4
6
8
10
12
14

Objective Function vs Iteration(Huber Prior)
Objective Function
Iterations
600
500
400
300
200
100
0
2
4
6
8
10
12
14
16
18

Objective Function vs Iteration(Discontinuity-adaptive Prior)
Objective Function
Iterations
35
30
25
20
15
10
5
0
10
20
30
40
50
60