Table of Contents


```
addpath '../../2/code/';
addpath '../../2/code/mrf';
addpath '../../2/code/mrf_derivatives';
addpath '../../common/';
load('../data/assignmentImageDenoisingBrainNoisy.mat');
```

Part (a)

```
sigma = getNoiseLevel(imageNoisy);
% Noise level in the background
display(sigma);

best_alpha = 0.89;
best_gamma = 0.5;
algorithm = 1;
[estimate_algorithm_1, series_1] = applyGradientDescent(imageNoisy, algorithm,...
        best_alpha, best_gamma, 1);

best_alpha = 0.032;
best_gamma = 0.0070;
algorithm = 2;
[estimate_algorithm_2, series_2]  = applyGradientDescent(imageNoisy, algorithm,...
        best_alpha, best_gamma, 1);

best_alpha = 0.003;
best_gamma = 0.007;
algorithm = 3;
[estimate_algorithm_3, series_3]  = applyGradientDescent(imageNoisy, algorithm,...
        best_alpha, best_gamma, 1);
```

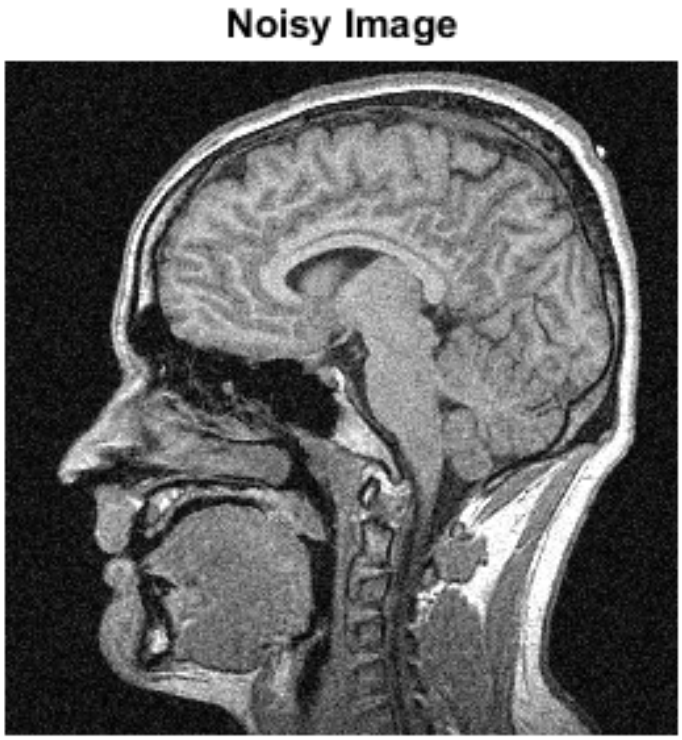
```
sigma =

    0.0857
```

Part (b)

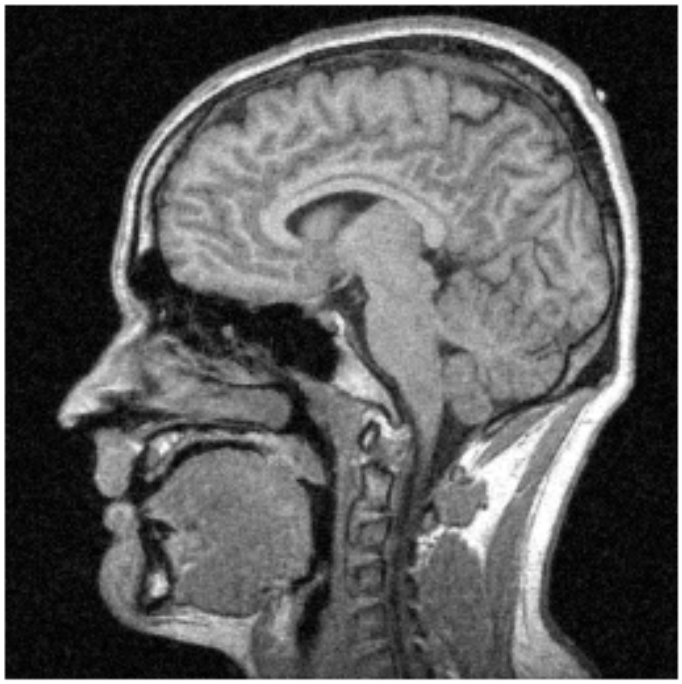
Noisy

```
figure; imshow(abs(imageNoisy)); title('Noisy Image');
```

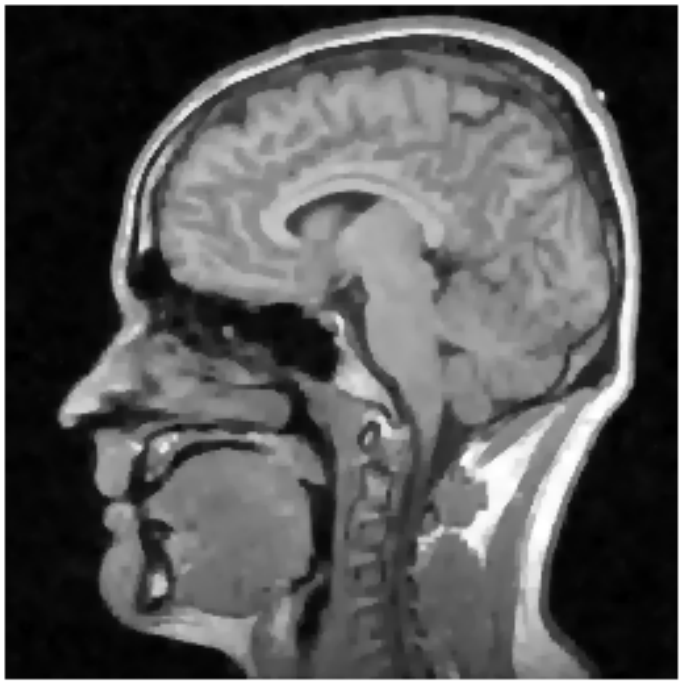
```
% Quadratic MRF
figure; imshow(abs(estimate_algorithm_1)); title('Quadratic MRF Image');
% Huber MRF
figure; imshow(abs(estimate_algorithm_2)); title('Huber MRF Image');
% Adaptive MRF
figure; imshow(abs(estimate_algorithm_3)); title('Adaptive MRF Image');
```

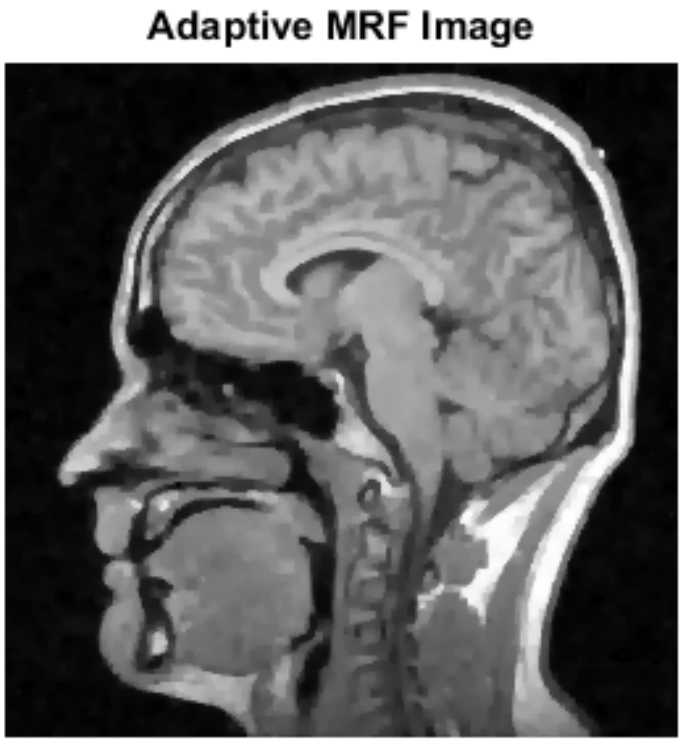


Quadratic MRF Image



Huber MRF Image

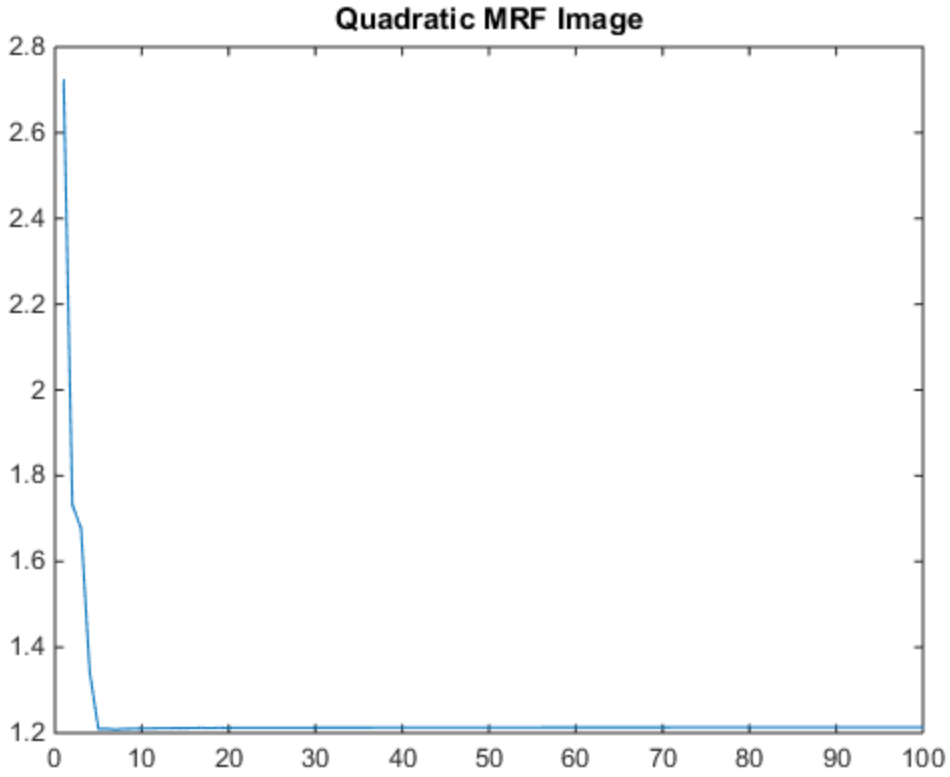


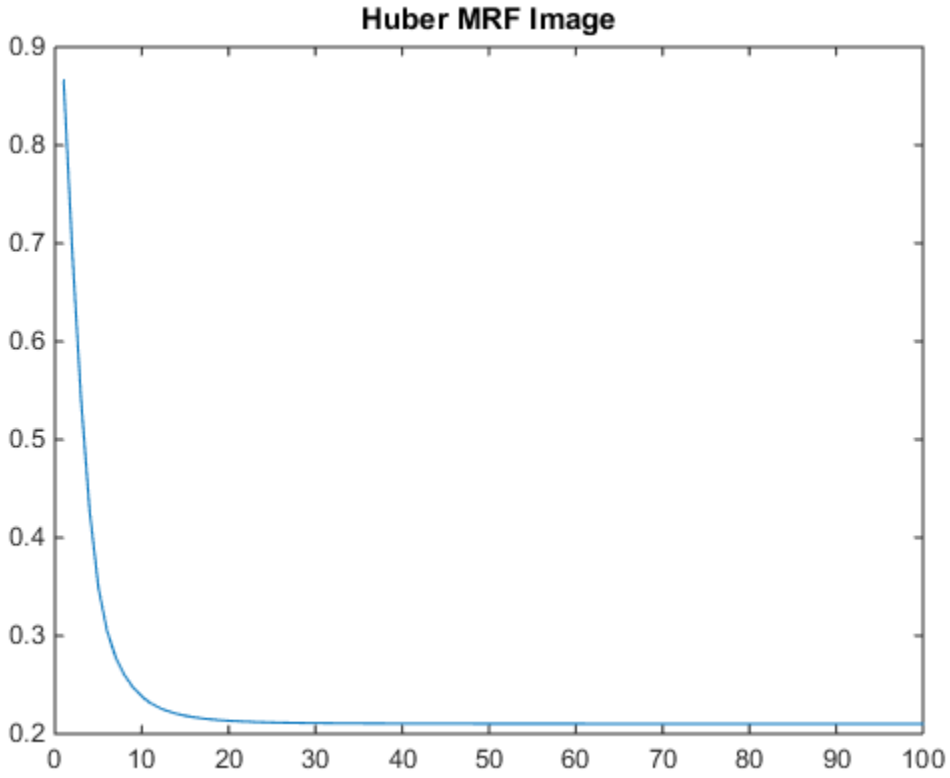


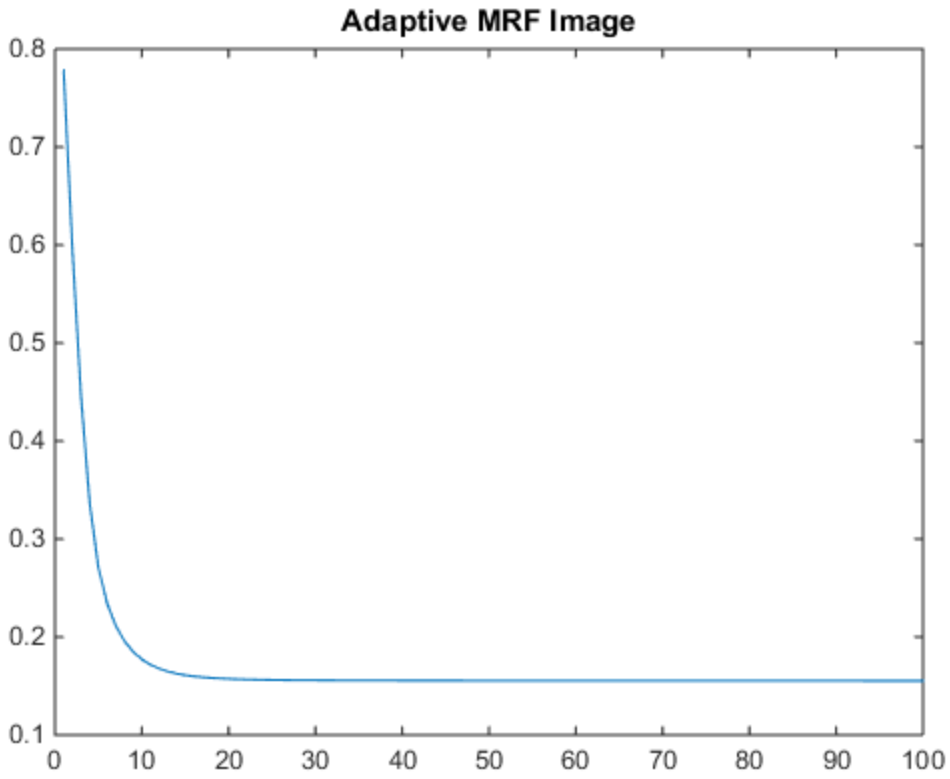
Part (c)

Quadratic MRF

```
figure; plot(1:100, series_1); title('Quadratic MRF Image');
% Huber MRF
figure; plot(1:100, series_2); title('Huber MRF Image');
% Adaptive MRF
figure; plot(1:100, series_3); title('Adaptive MRF Image');
```


Quadratic MRF Image
2.8
2.6
2.4
2.2
2
1.8
1.6
1.4
1.2
0
10
20
30
40
50
60
70
80
90
100


Huber MRF Image
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0
10
20
30
40
50
60
70
80
90
100



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