ECE641 Lab2 Report

Liming Chen (PUID: 0032119074, Mechanical Engineering)

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1 MAP Estimation with Non-Gaussian Prior

1.1 Basic Techniques for MAP Restoration with non-Gaussian Prior

1.1.1

The restored image is shown in Figure. 1

Figure 1: Basic Technique, MAP estimate of the image, $\hat{\sigma_x} = 6.95$

1.1.2

When $\sigma_x = 5 * \hat{\sigma_x}$, the restored image is shown in Figure. 2. When $\sigma_x = (1/5) * \hat{\sigma_x}$, the restored image is shown in Figure. 3.

Figure 2: Basic Technique, MAP estimate of the image, $\sigma_x = 5 * \hat{\sigma_x}$

Figure 3: Basic Technique, MAP estimate of the image, $\sigma_x = (1/5) * \hat{\sigma_x}$

1.1.3 Plot the cost function

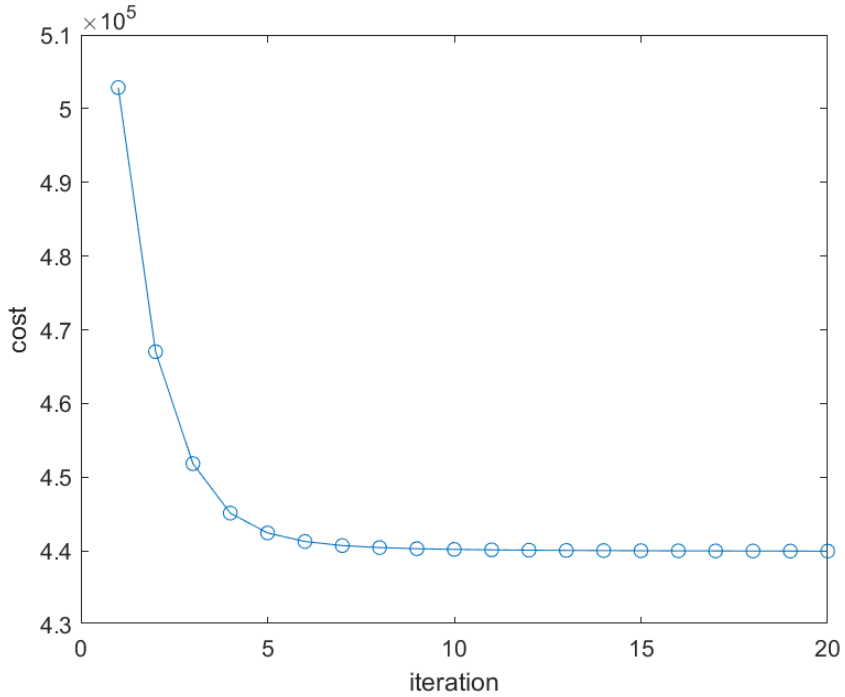

Figure 4: The cost values versus iterations

1.2 MAP Restoration using Majorization to Optimize non-Gaussian Cost Function

1.2.1

The restored image is shown in Figure. 5

1.2.2

When $\sigma_x = 5 * \hat{\sigma_x}$, the restored image is shown in Figure. 6. When $\sigma_x = (1/5) * \hat{\sigma_x}$, the restored image is shown in Figure. 7.

Figure 5: Majorization, MAP estimate of the image, $\hat{\sigma_x} = 6.95$

Figure 6: Basic Technique, MAP estimate of the image, $\sigma_x = 5 * \hat{\sigma_x}$

Figure 7: Basic Technique, MAP estimate of the image, $\sigma_x = (1/5) * \hat{\sigma_x}$

1.2.3 Plot the cost function

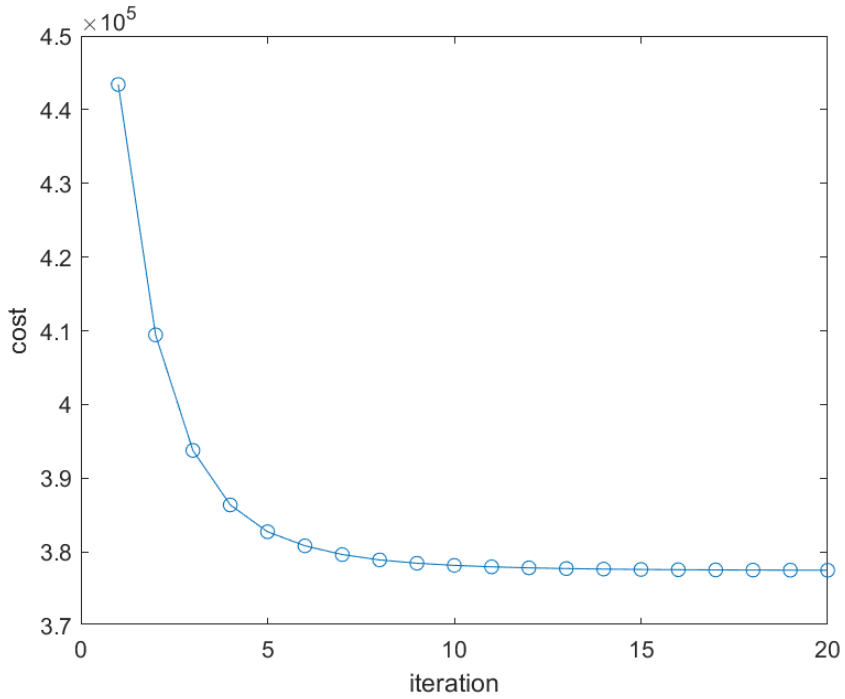

Figure 8: The cost values versus iterations

2 Appendix

The source code: `https://github.com/chenliming0422/ECE641-Lab2`