EE5175: Image Signal Processing

Lab-12

Deblurring with Wiener Filter

Apr. 28

For the given image, perform Wiener filtering based image restoration for the following scenarios (σ_n - Gaussian noise σ, σ_b - Gaussian blur σ)

- $\sigma_n = 8$, a) $\sigma_b = 0.5$, b) $\sigma_b = 1.0$, c) $\sigma_b = 1.5$
- $\sigma_b = 1.0$, a) $\sigma_n = 5$, b) $\sigma_n = 10$, c) $\sigma_n = 15$

NOTE:

In the Wiener filter expression, treat the term $\frac{S_{nn}}{S_{ff}}$ as a constant (say, k) and vary it from 0.01 to 2.0 in steps of 0.001. For each case, pick the k that gives minimum RMS error between the original image and the estimated image.

This is a simplified form of the Wiener filter and reveals the interplay between blur and noise for the deblurring problem.

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