

Homework #7

Due Date: Mar. 26, 2002

1. [30] Lim, Problems 9.14
2. [10] Lim, Problem 9.21, parts a & b.
3. [90] Deblurring. Download the image of the house, `hw7image.mat`, from the course web site. We will apply a blur to this image and then look at different ways to de-blur it.
 - a. Blur the image using `conv2` and the following blur function
`b = ones([7 7])/49;` and display result using `imagesc` and determine the MSE relative to the unblurred image..
 - b. Create an inverse filter, $H1$, that is the inverse filter of b . Apply to the blurred image and display and determine the MSE relative to the unblurred image.
 - c. Create an inverse filter, $H2$, that is clipped at a level of $g=5$. Apply to the blurred image and display result and determine the MSE relative to the unblurred image.
 - d. Create the iterative inverse filter, $H3$. Suppose we set the value of $I = 0.5$. Is the iterative approach stable for this value of I . Apply to the blurred image for number of iterations $k = 2, 10, \text{ and } 20$. Display results and determine the MSE's relative to the unblurred image.
 - e. Add Gaussian noise to the image with variance = 4. Repeat steps a) through d).
 - f. Comment (briefly) on the relative advantages and disadvantages of the above approaches.