

HW 4 (100 points total, due 09:10, 12/2/21)

Problem 1 (30 points)

The images shown in the left column of Fig. 5-27 are corrupted by motion blur and additive noise, and those in the central column are restored by using the inverse filtering technique described in Section 5.7 of the textbook. You can see that the restored images in the central column have a diagonal streak pattern, whereas the images restored by the Wiener filter in the right column do not have such pattern. Explain why this pattern occurs to the images in the central column.

Problem 2 (35 points for each image)

You can find two images along with this homework on the course website, one being the “photographer” image corrupted by motion blur and additive Gaussian noise and the other being the “football players” image. For the former, we do not know the amount of motion blur and Gaussian noise. For the latter, we do not have any information about the image degradation. But it is reasonable to think that a Wiener filter may help alleviate the degradation. Use a trial-and-error strategy to identify the best Wiener filter for each image.

- 1) (5 points) Write the expression and parameters of the best Wiener filter.
- 2) (30 points) Show your best restoration result.