Lab 4 (assignment date: 2018/04/25; due date 2018/05/08)

- **Image Restoration**

1. Remove the noise from the input images Q4_1_1.tif, Q4_1_2.tif, Q4_1_3.tif and Q4_1_4.tif. Submit your code and the output images with file names of Q411_学号.m and Q411_学号.tif, etc. Explain what method is used to each of the images.

2. Image Q4_2.tif was degraded from an original image due to the atmosphere turbulence given on slide 65 with k = 0.0025. Restore the original image from the input Q4_2.tif by using full inverse filtering, radially limited inverse filtering and Wiener filtering. Submit your code and the output images with file names of Q42_学号.m and Q42_学号.tif, etc. Discuss how the parameters, if any, are determined, and the different effects by using the different algorithms.

   Additional question (with additional marks)

3. Restore the original images from the inputs Q4_3_1.tif, Q4_3_2.tif and Q4_3_3. Submit your code and the output images with file names of Q431_学号.m and Q431_学号.tif, etc. Explain what method is used to restore each of the images.

- Discuss the following, but NOT limited to the following:

1. Slide 27 shows the results using contraharmonic filters. Why the algorithms thins the dark part for Q>0, and thickens the black part for Q<0?

2. Slide 38 shows the results using adaptive local noise reduction filters. A global variance σ^2_η of the image has to be estimated. What's the effect or what's the consequence if the estimated σ^2_η is larger than the actual global variance? What if smaller?

- Send your codes and report to
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- Image files are named accordingly.