LAB 03: REDUCING NOISE

CS353 IMAGE PROCESSING

Zach Anthis

Neapolis University Pafos

INTRO

During this week, you are expected to apply some slightly more complex image enhancement techniques.

STEP 1:

Use your script from last week, to import another monochrome image of Lena.

STEP 2:

Find a way to add some Gaussian (μ=0, σ=0.1) noise to the image.

STEP 3:

Apply a 3 x 3 and a 7 x 7 Mean mask, and place the resulting (filtered) images side by side to compare.

STEP 4:

Return to the original and add some salt-and-pepper noise (use random number generation if needed).

STEP 5:

Now, take this new noisy version (let's call it "seasoned") and apply a 3 x 3 and a 7 x 7 Median mask to it.

STEP 6:

Take the outcomes from both steps 3 and 5 and place them side by side to compare.

STEP 7:

Return to the original once more and use a Fourier Transformation (FT) to extract its magnitude and phase.

STEP 8:

Apply a 5 x 5 low-pass Fourier mask (e.g., ideal circular) onto the seasoned version of the image from step 4.

STEP 9:

Subtract the smoothened version generated in the previous step from the original, to obtain an unsharp mask.

STEP 10:

Add the unsharp mask back to the original (imported) version of your image to sharpen (i.e., highlight edges).

STEP 11:

Create another document containing code snippets alongside output screenshots for each step.

STEP 12:

Save your work, and submit the document under the corresponding slot on Moodle.

THE END