

Assignment#5 PART 2: Filtering in the Fourier domain

Filtering in the Fourier domain

Requirements:

Using the GUI you created in assignment 1, after browsing for an image (RGB or Grayscale) you are required to:

1. Display the image
2. Apply filtering in the Fourier domain:
 - a. Create a box filter with kernel size (USER INPUT) in the spatial domain and pad it
 - b. Transform the filter and the image to the Fourier domain using what you did in A5.1 Fourier part 1
 - c. Multiply the filter with the image in the Fourier domain
 - d. Apply inverse Fourier transform to result of “c”
3. Display the result of “2”
4. Using what you did in A4 Unsharp Masking apply spatial filtering with the same box filter kernel used here
5. Subtract the spatially filtered image from the Fourier filtered image
6. Display the result of “5”
7. Comment on the difference

Submission

Submit working code files through Blackboard.

- This is an individual based assignment.
- The due date for submission on Blackboard is [Wednesday, 15/12/2021](#)
- No need to upload the GUI

This is a two-part task. The in-person submission will be for the two parts of the task together on [Thursday 16/12/2021](#) in room **20424** from 11 am to 1 pm

General instructions

- You are allowed to use built-in functions for `fft2`, `ifft2`, `fftshift`, `ifftshift`
- Handle any errors or exceptions that might occur (e.g., corrupted image)
- You are allowed to use MATLAB (App Designer) or Python (PyQt)
- Your code should be clear, understandable, and documented (COMMENTS)
- Follow a consistent naming convention for variables and functions
- The assignment will be graded out of 5