University Kasdi Merbah - Ouargla

Faculty of New Technology of Information and Communication

Department of computer science

Module: TIVO

Lab Sheet 2

This lab aims at applying the Fourier transform and recover the image using Fourier coefficients. As a second aim, we target performing both denoising and edge detection using low and high pass filters. Below, you find the list of the required tasks

1. Select an image from your drive, we denote this image by *I* (gray-scale image). Try to select a simple image with a uniform background.
2. Resize the image to 100x100 (using existing built-in functions).
3. Encode the image using Fourier transform
4. Recover the image using the inverse 2D DFT using the 5x5, 10x10, 40x40 top left coefficients, respectively.
5. Recover the image using the inverse 2D DFT using the 20x20, 50x50, 90x90 bottom right coefficients, respectively.
6. Display the amplitude image (normalized and using the modified layout, where low frequency coefficients are fetched to the image center).
7. Add a Gaussian noise to *I* (using existing built-in functions), then, denoise it using low pass filter with a diameter of 3,10,30, respectively (display the results).
8. Apply high pass filter on *I* , by considering a filter with a diameter of 3,10,30, respectively (display the results).