

Computer Vision Exercises

Pyramids

November 11, 2018

1. Generate a **black and white checkerboard binary image** with Matlab's checkerboard function (10x10, 2x2 elements)
2. Implement a function that **resamples the image** taking every **third pixel in both dimensions**. Plot the resulting image. What happens?
3. Now repeat the procedure, but apply a gaussian filter (hand-tune window size and standard deviation) to the image before resampling. Has the result improved? How do you explain the differences (if any)?
4. Resample the image to a third of the original resolution, Matlab's *imresize*. What is the difference to the previous procedure?

Using image lena.jpg

5. As in the previous classes, load the image lena.jpg as a grayscale image.
6. Compute the magnitude and phase transform of the image (FFT); What do they represent?
7. Reconstruct the original image from the magnitude, and magnitude + phase. Which do you consider is the best reconstruction?
8. Construct a 4-level Gaussian pyramid (blur and resample) with decreasing resolution (half the resolution in each level).
9. Use the Gaussian pyramid created and construct a similar Laplacian pyramid. What is the result?