Department of Computer Science and Engineering

National institute of Technology calicut

CS4043 IMAGE PROCESSING
Exercise Set 3

Date of posting assignment : 10/1/2019
Date of Submission :16/1/2019

1. Perform following operations on the given image.
   (a) Find DFT of the given image.
   (b) Find the magnitude spectrum.
   (c) Find the phase spectrum.
   (d) Double the magnitude spectrum.
   (e) Reconstruct the image using the IDFT.
   (f) Reconstruct the image removing phase spectrum.
   (g) Put the results together in one window.

   Explain your results **[10 marks]**

2. Pick an image and follow the operations
   (a) Multiply image by $(-1)^{x+y}$.
   (b) Compute the DFT.
   (c) Take the complex conjugate of the transform.
   (d) Compute the IDFT.
   (e) Multiply the real part of the result by $(-1)^{x+y}$.

   Compare the input image and output image. Explain (mathematically) why the output image appear as it does. **[7 marks]**

3. Obtain the fourier spectrum of a given image. Pad the image with zero's, obtain fourier spectrum.
   (a) Explain the difference in overall contrast **[2 marks]**
   (b) Explain the significant increase in signal strength along the vertical and horizontal axes of spectrum on the second output image.**[3 marks]**

4. What is the result of two DFT performed in sucession? Apply a DFT to an image, and then another DFT to the result. Can you account for what you see?[**3 marks**]