BSysE530: Homework # 3

Due by 2/15/19

Note: Please present results with appropriate captions in a word file (try to be professional). Also include answers to respective questions. You can append code at the end or attach them separately.

Part 1: Intensity transformation

1. Apply different gamma corrections (gamma >1, =1 and <1) and histogram equalization to the red channel of Apples.jpg.
2. Plot results against each other. What did you observe?

Part 2: Spatial Filtering

3. Apply mean, median and Gaussian filters to any portrait picture of yourself.
4. Plot the results against the original image.
5. What are the advantages and disadvantages of each of these three filters?
6. What is separability in Gaussian filtering? Implement separability.

Part 3: Frequency Domain Filtering

7. Take forward and inverse FFT of any portrait picture of yourself. Use both 1D and 2D FFT functions. Plot both magnitude and phase plots. Compare the original and inversed images.
8. Make phase plot zero and take inverse FFT. What did you observe?
9. Make magnitude plot unity and take inverse FFT. What did you observe?
10. What are the steps in frequency domain image filtering?
11. Plot frequency responses of a low pass and a high pass filters and use those to filter your profile picture. Plot results against the original image. Add the output of high pass filter to the original image. What did you observe?
12. What is wraparound error? What is zero padding?