Department of Computer Science and Engineering

Course: CSE 326 (Digital Signal Processing Lab)

Laboratory Assignment

(Submission deadline: Aug 10, 2022)

1. Generate and plot the elementary signals in DSP (Impulse, unit impulse, ramp, Exponential, and sinusoid signals).
2. Compute the linear convolution of two signals (Eqn. 2.3.17).
3. Compute the cross-correlation sequence of two signals x(n) and h(n). [Hint: 2.6.1]
4. Determine the autocorrelation sequence of the signal x(n). [Hint: 2.6.1]
5. Determine and plot the Fourier series of DT periodic signal. [Eqn. 4.2.7 and 4.2.8]
6. Compute Discrete Fourier Transform (DFT) of a signal using DFT equation.
7. Compute inverse DFT of the signal obtained in (6). Cross check your results with Matlab/ Python library functions.
8. By means of the DFT and IDFT, determine the response of the FIR filter with impulse response h(n) to the input sequence x(n). [Hint: Ex. 7.3.1]
9. Compute the Fast Fourier Transform (FFT) using divide and conquer approach (e.g N=2 x N/2).
10. Compute the FFT of a given signal with N = 8 using Radix-2 algorithm.