DSP Notes

Discrete-Time-signal-Processing 3rd-edition

Chap # 1. 30/9/23.

Chapter no 1: INTRODUCTION.

* **Signal:**

Information converted into electrical form suitable for transmission/processing. It is an electromagnetic representation of Data.

→ Continuous signals are those for which both dependent(y) and independent(x) variables are continuous. eg:

$y = \sin t \; ; \; 0 \le t \le 2 \; ; \; -1 \le y \le 1$

It has infinite values that can be measured.

→ Discrete signals are those for which independent(x) is discrete and depende(y) is continuous. eg

$g(n) = \sin n \; ; \; n = [0, 1, 2] \; ; \; -1 \le g(n) \le 1$

It has finite values that can be counted.

→ Digital signal are those for which both dependent(y) and independent(x) are discrete. eg

$y = \sin n \; ; \; n = [0, 1, 2] \; ; \; y = [-1, 0, 1]$.

→ Signal processing is a branch of electrical engineering ~~that~~ applied mathematics that deals with operation

on or analysis of signals.

→ Signal processing deals with the representation, transformation, and manipulation of signal and the information the signals contain. eg; adding, convalution, multiplication etc.

→ In communication, ~~post~~ pre processing (like modulation, conditioning and compression) is done before transmitting and post processing is done after receiving the signals.

→ MPEG: "Moving Picture Expert Group"

→ JPEG: "Joint Picture Expert Group"

→ ISO: "International Organisation of Standardi"

→ A/D: "analog to digital"

→ D/A: "digital to analog".

→ SNR (Signal to Noise Ratio) is used to measure the power of a signal to the level of background noise. It is unitless but often expressed in decibles (dB). A 1:1 (greater than 0dB) indicates more signal than noise.

→ Multidimensional signals processing application are also very high in oil exploration, earthquake measurements

nuclear tests, video coding, arial photography, deep-space probs and many more.

→ Multidimensional signal processing is one of many advanced topic that build on signal-processing fundamentals.

→ One of the first use of DSP was in geophysical exploration, where seismic are digitalized and saved.