22-12-2021 DSP

Ch: 2 (from Book)

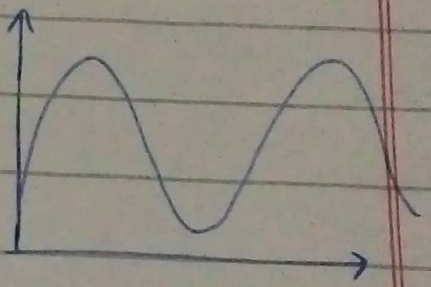
Continuous data = uncountable (infinite)
when we have infinite data (matrix / wave) then our memory + processor should Be of infinite Required to much

0 ⟶ 1 0.9, 0.001, 0.002 to much -

Discreate Data = can be countable (finite)

Sampling/Sample is used to deal with Continous data

→ Solid line is a Continous wave-



→ this wave contain infinite points.

A specific time interval is Required (used) to select one point from Continous data is called **Sampling** - and specific time will be one mintues, second, day, hour, week years any thing - according to our Requirem

T = Sampling interval - (what will be the interval for Sam

Data Compression

Data is compressed By using Sampling / Quantization -

Sampling Frequency

کس شرح سے sample collect کر رہا ہے

$f = \frac{1}{T}$

→ interval is alway fixed for Sampling

$f_s = f$

$f_s = 100$ per Second

$f_s = \frac{1}{100}$ (one second kay 100 part kar rahy hn)

Original data is in Continuous form we can't deal with it as we are not having analog Devices. We have digital device. Convert it into Digital By (sampling / Qantization) Now again we have to display output in form of Analog signal (Continuous wave).

(limited data) Discrete → Continuous (infinite) (un limited data)

→ Is this possible ?? (Yes it is By using Sampling theorm)

How ??

$$\boxed{f_s \geq 2 f_{max}}$$

Method equation for Sampling theorm.

Discrete ... data original ... then ... theorm Sampling ... you for easy be will it go back in original form By using that Sampling points.

$$f_s \geq 2 f_{max}$$

f_s = Sample frequency

f_{max} = maximum frequecy Component

→ Input signal may check first max frequency then

→ Select Next invertal By Using

$$f_s \geq 2 f_{max}$$

→ Sampling Operation is Done By Using this formula. (with out error).

e.g $f_{max} = 40$.

$f_{min} = 40$.

then it's f_s should be equal or > then 80.

⇒ Reconstruction / Regeneration.

Original Distance will Be distrub when we don't used (follow) the theorm.