1 Time Domain

1.1 init

f_s = sampling rate
λ = wavelength
T = period
ω = angular frequency

1.2 wavelength λ

$$\lambda = \frac{c}{f}$$

1.3 period T

$$T = 1\,ms = 1000\,Hz$$

1.4 angular frequency ω

$$\begin{aligned}\omega &= 2\pi f \\ &= \frac{2\pi}{T}\end{aligned}$$

$$\begin{aligned}\omega_0 &= 2\pi T \\ &= \pi\frac{f_0}{fs}\end{aligned}$$

1.5 unit pulse & unit step

unit pulse:

$$\delta(n) = \begin{cases}1, & \text{if } n = 0 \\ 0 & \text{otherwise}\end{cases}$$

unit step:

$$u(n) = \begin{cases}1, & \text{if } n \geq 0 \\ 0 & \text{otherwise}\end{cases}$$

1.6 harmonic signals

$$n = [1 : t \cdot f_s]$$

$$\begin{aligned}x[n] &= sin(\omega_0 n + \varphi) \\ &= sin(2\pi f_0 T + \varphi) \\ &= sin(2\pi\frac{f_0}{fs}n + \varphi)\end{aligned}$$

2 Frequency Domain

2.1 init

f_s = sampling rate
λ = wavelength
T = period
ω = angular frequency

3 Other