

Week 1: Tuesday, Jan. 24, 2023

DSP - Digital Signal Processing

Digital : allows processing by computers

Signal : · often they are functions of time
 · images are functions of x- and y-coordinates

Processing: · analysis and transformation of signals

Examples of signals

- voice signal
- image
- video
- light - optical signal for communications
- radio signals
- Radar
- MRI
- X-rays

Math of signals

$x(t)$: function of time

Sinusoidal signals

$$x(t) = A \cos(2\pi f t + \phi)$$

The parameters are:

A : amplitude
 f : frequency $\Rightarrow T$: period = $\frac{1}{f}$
 ϕ : phase.

Example:

$$x(t) = \cos(2\pi t) \quad \left\{ \begin{array}{l} A = 1 \\ f = 1 \\ \phi = 0 \end{array} \right.$$

