

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

$\phi$  : phase.

$$\Rightarrow T: \text{period} = \frac{1}{f}$$

Example:

$$x(t) = \cos(2\pi t)$$

$$\left\{ \begin{array}{l} A = 1 \\ f = 1 \\ \phi = 0 \end{array} \right.$$

