ECE 301, Pool

Note Title 8/19/2012

Course syllabus is available online.

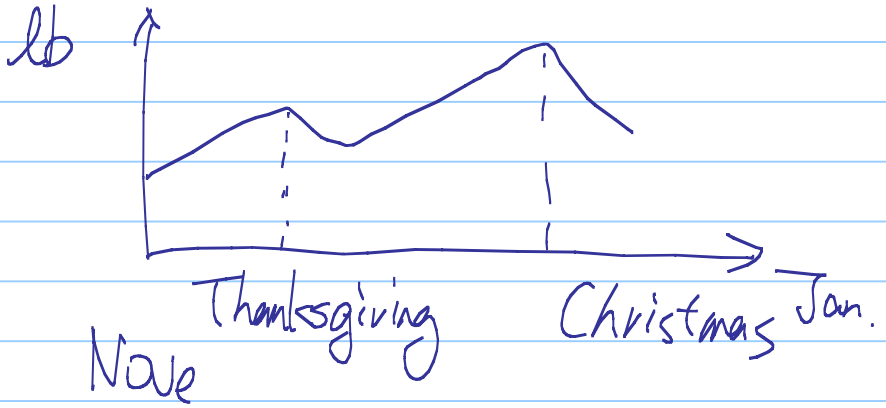
* Overall course goal:

A mathematical study of "signals" & "systems"

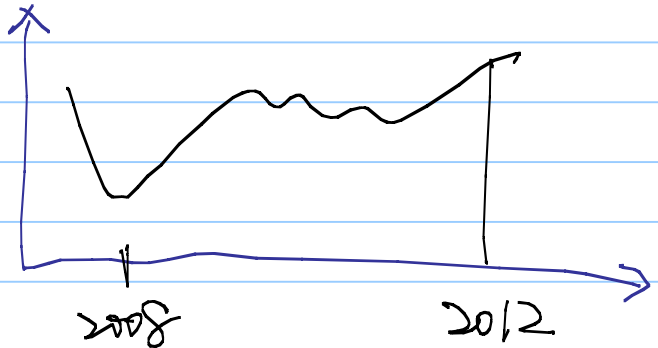
Q What are signals?

A: Definition #1: Something that contains info.

Ex: The curve of my weight from Nov. to Jan.

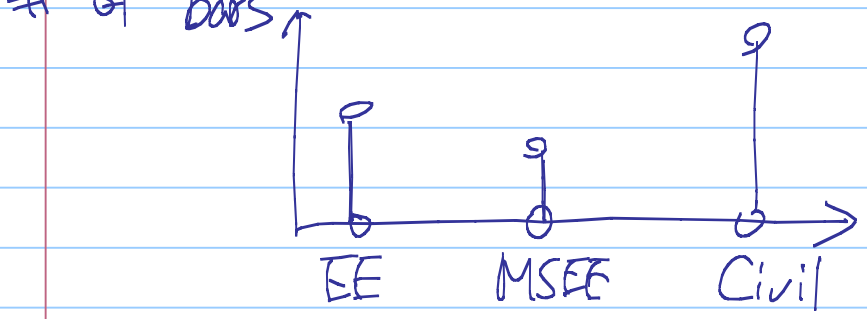


Ex: Dow Jones Stock Index



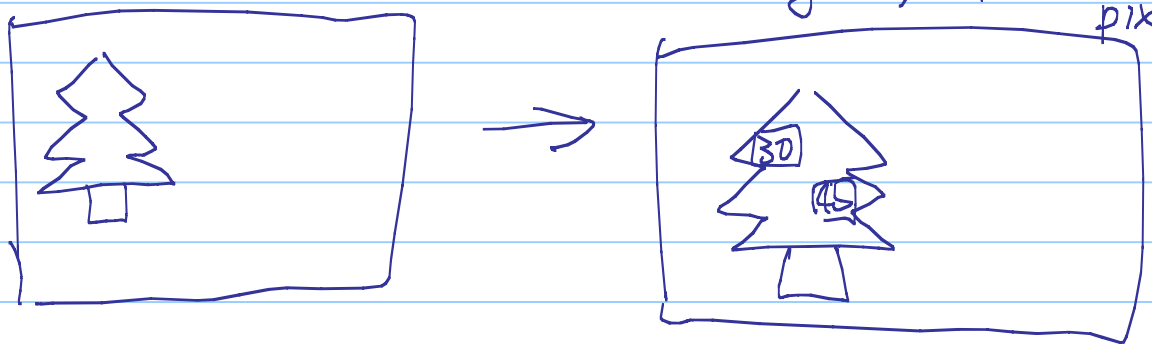
Ex: The voltage waveform in ECE202

Ex: EM waves of a cellular phone



Ex: A picture is a signal

2D-signal, pixel by pixel



Definition #2: A signal is a series of data indexed by $t \in \mathbb{R}$ or $n \in \mathbb{N}$

real numbers

integers

continuous time (CT)

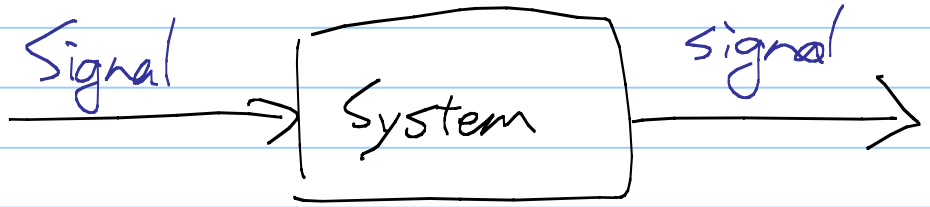
discrete-time (DT)

Ex: $x(t)$ or $x[n]$

continuous time signal (CT signal)
discrete time signal (DT signal)

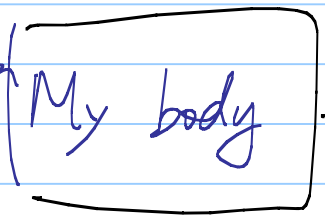
Q: What are "systems"?

A: Definition: (Def:) Anything that takes "signals" as input and outputs "signals"



Ex:

daily food consumption (lb)



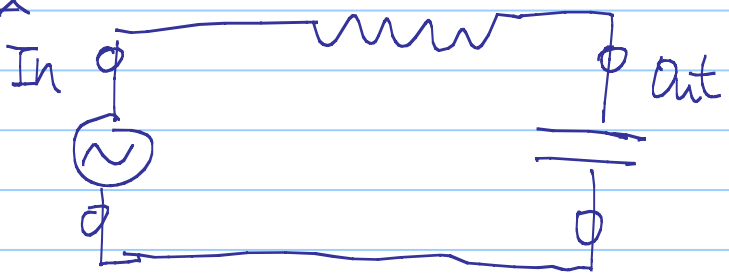
weight (lb)

Ex:

Oil price

Dow Jones

Ex:



RC circuit

Ex: # of bars → Cellular phone → voice quality

EM wave in the air → AM radio → audible sound

Ex  → Photoshop → 

* Different types of systems.

Illustration	Type:	Examples
$x(t)$ → Sys → $y(t)$	CT-in CT-out sys	Linear circuit
$x(t)$ → Sys → $y[n]$	CT-in DT-out	Digital recorder
$x[n]$ → Sys → $y(t)$	DT-in CT-out	iPod player
$x[n]$ → Sys → $y[n]$	DT-in DT-out	Photoshop