ENSC380
Lecture 1

Objectives:

- What is a signal?

- How can signals be categorized?

- What are some examples of each signal type?

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- Signal is any physical phenomenon which conveys information and is *usually* a function of time. Sometimes a signal can be a function of space, e.g., an image.

- Signals can be divided into different types:
  - Continuous-time (CT) vs Discrete-time (DT)
    Example:

  - Continuous-value vs Discrete-value
    Example:

  - Random vs Deterministic
    Example:

Examples of Signals
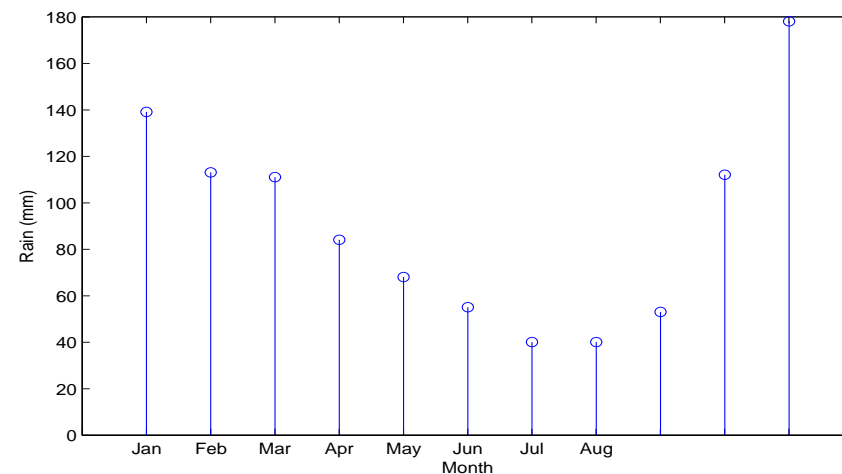
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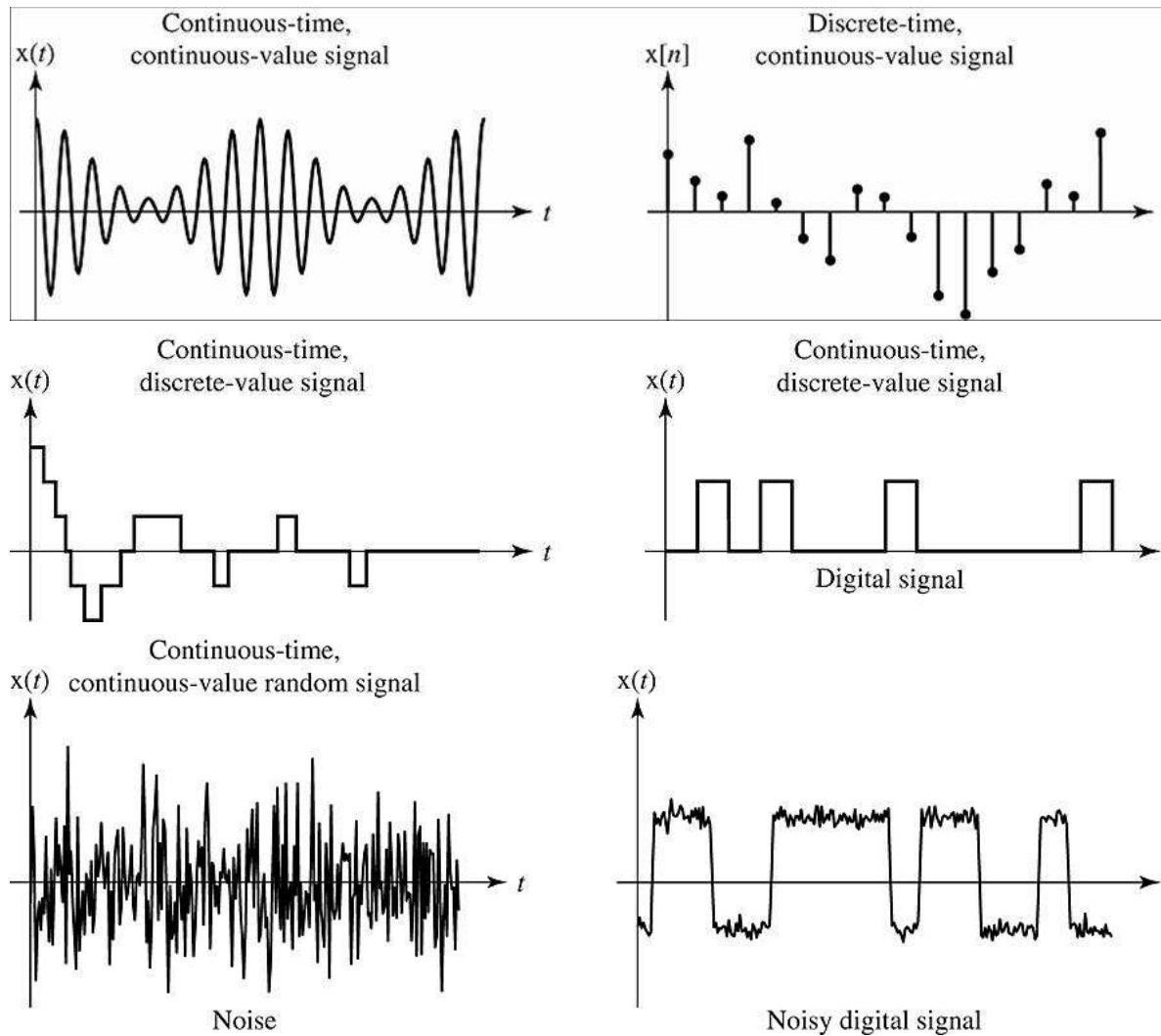
CT vs DT Signals

- Many signals are CT by nature, e.g., human speech:
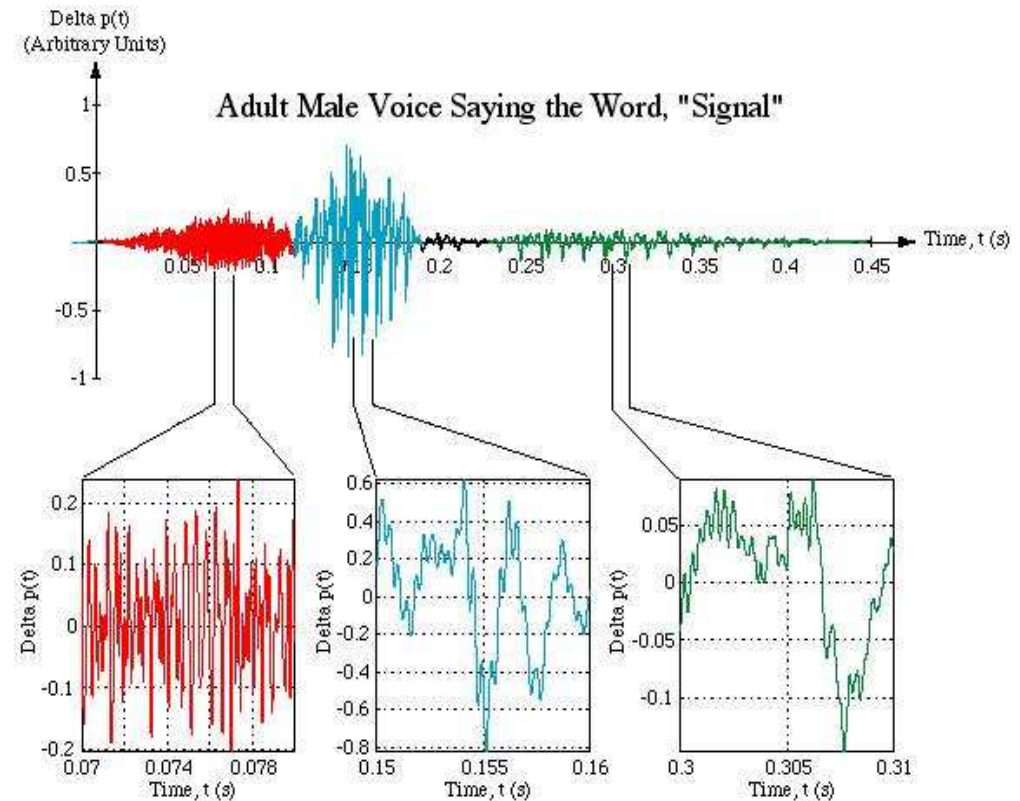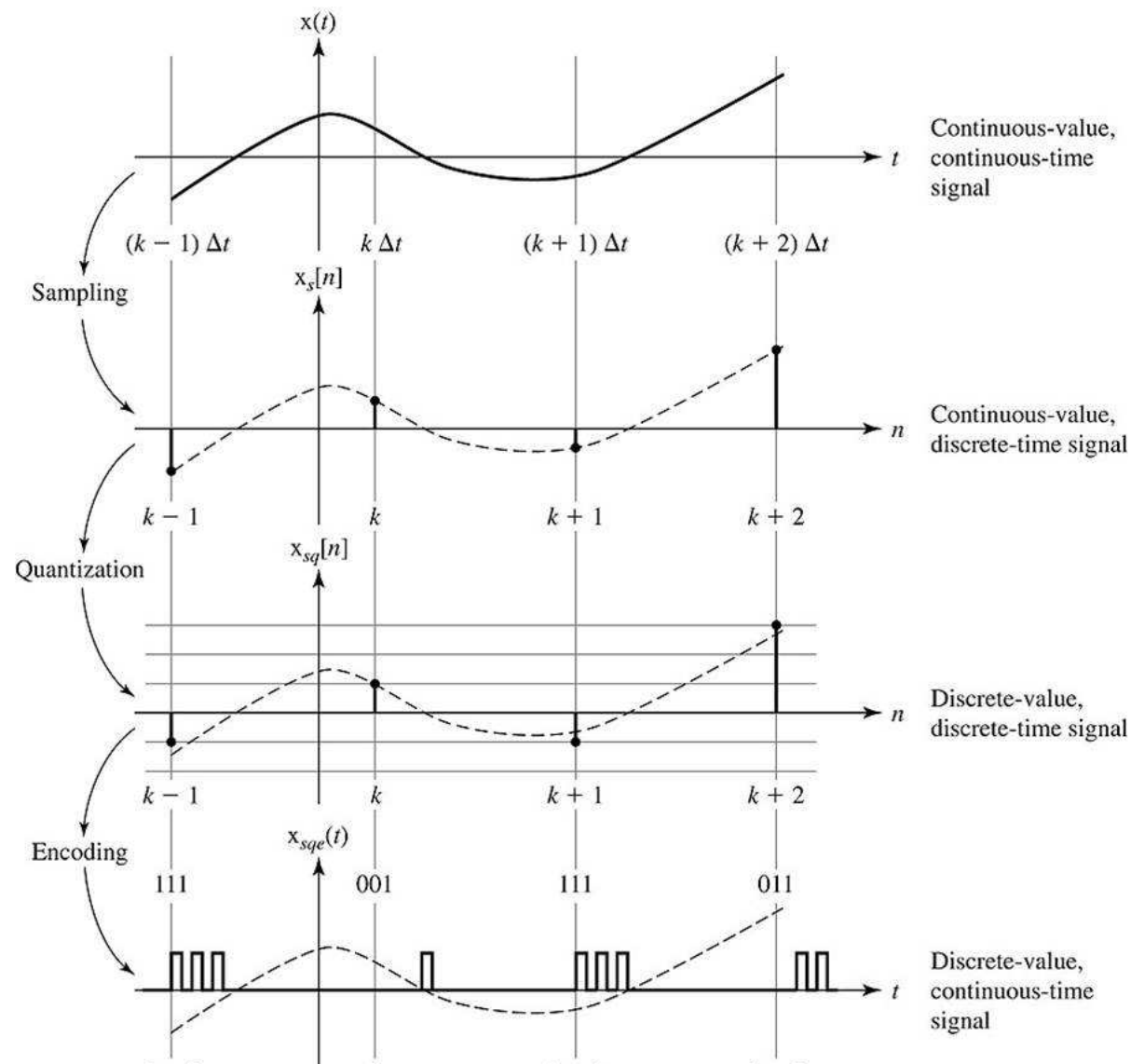
- Many signals are DT by nature, e.g., Average monthly rainfall in Vancouver from 1971 - 2000. (Source: Wikipedia)
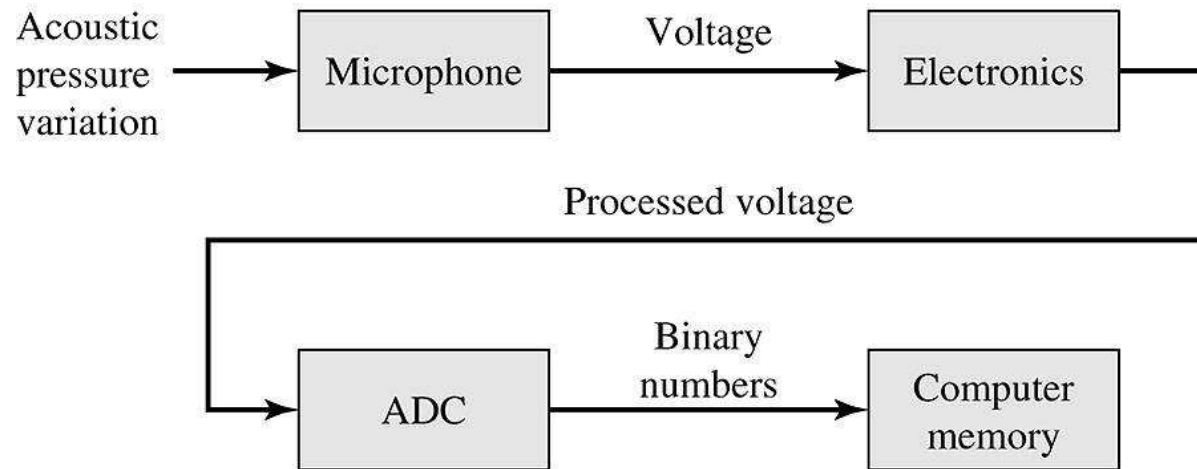
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Sometimes a discrete-time, discrete-value signal is created from a continuous-time, continuous-value signal. This is also referred to as "Analog to Digital Conversion" (ADC).

Sound Recording

- An example for the application of ADC is the computer's sound recording system:

- The recorded male voice sample you saw earlier is in fact DT (It was originally CT, but when recorded on the computer, it became DT!). However, the sampled values are close enough to each other, such that when Matlab plots the function and connects the discrete values with lines, we see it as a CT signal.

Atousa recorded voice,saying: "Today is the first day of the rest of your life" (Window's Sound Recorder). File name: "atousa_8kHz_8bits_mono.wav". Format: **mono**, **8 kHz** sampling rate (8000 samples per second), **8 Bits** per sample

"Today is the first day of the rest of your life", Speaker: Atousa

Above signal, zoomed between almost 0.75 (sec) to 0.9 (sec)