Multimedia

§1 Basics

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§1.1 What?

- Multimedia from the user perspective:

  To represent information do not only use

  text or graphic or audio but

  text and graphic and audio.

§1.1 Why?

- Using a multimedia representation helps to memorize information in a natural way

A human remembers
10%	of what she reads
20%	of what she hears
30%	of what she sees
50%	of what she hears and sees
70%	of what she says
90%	of what she says and does.

➡ Perception medium

§1.2 Definitions

Different definitions of medium

- Perception medium

- Representation medium

- Presentation medium

- Storage medium

- Transmission medium

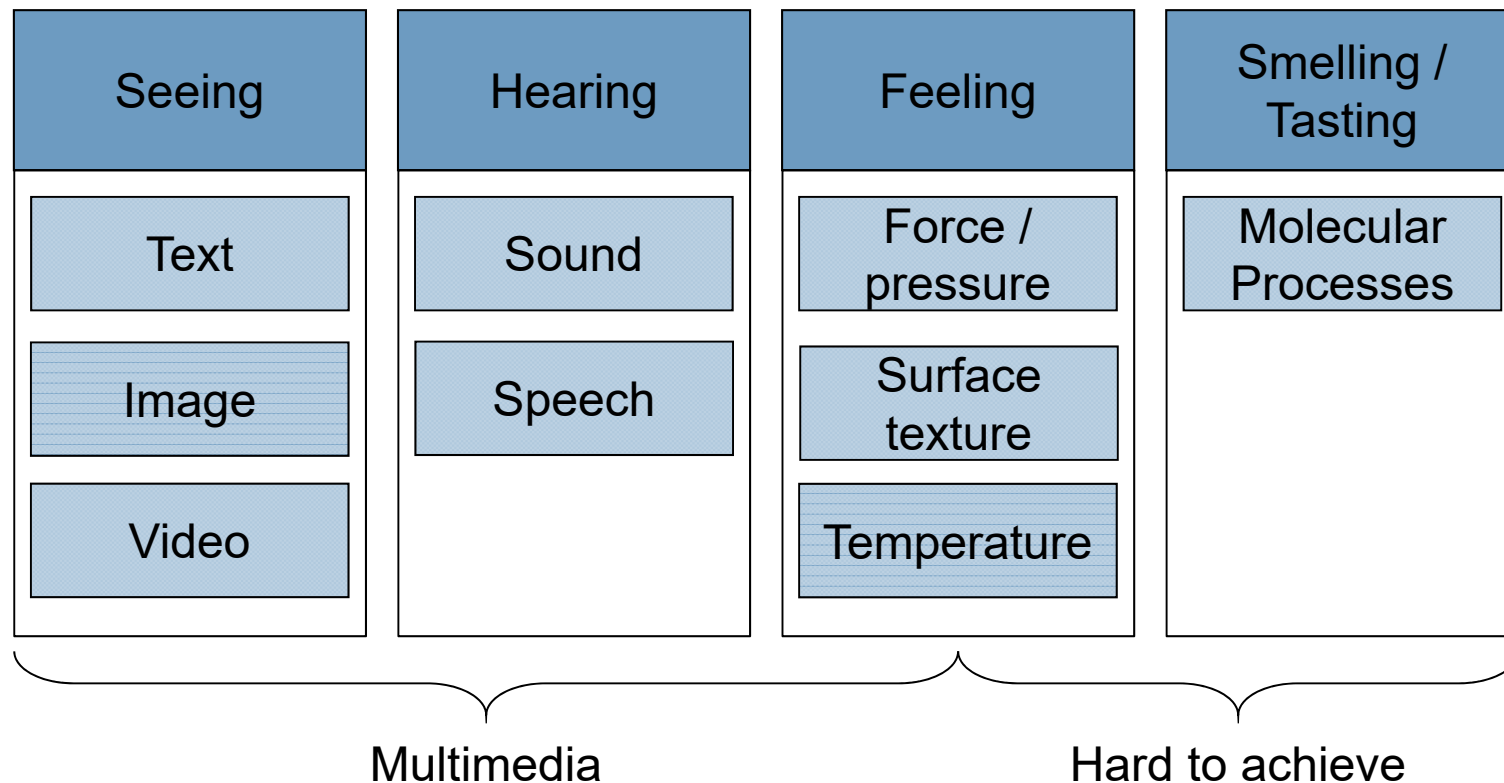# §1.2 Definitions

Perception medium

- Derived from the human senses:

    How does a human perceive information?

- Hearing − auditive media:
  - music
  - noise
  - speech

- Seeing− visual media:
  - images
  - videos
  - text

- Feeling – tactile media:
  - mechanical forces, heat, etc.
  - surface texture

§1.2 Definitions

- Communication channels

Seeing	Hearing	Feeling	Smelling / Tasting
Text	Sound	Force / pressure	Molecular Processes
Image	Speech	Surface texture	
Video		Temperature	

Multimedia   Hard to achieve

§1.2 Definitions

Representation medium

- Derived from the computer representation:

  How is information coded in the computer?

- Examples:

  - Text: ASCII, EBCDIC, UNICODE
  - Audio: PCM-linear 16bit, .wav, .voc, .raw, .mp3 ...
  - Graphic: Videotext (CEPT), SVG, PICT, Postscript, ...
  - Images: Fax Group 3, JPEG, GIF, TIFF, ...
  - Video: PAL, SECAM, NTSC, CCIR-601, MPEG, ..
  - Animation: vrml, flash, …

§1.2 Definitions

Presentation medium

- Derived from the device/metaphor for in- and output of information:

  Which device or method is used for information in- and output?

- Input:

  - Device: Keyboard, mouse, camera, microphone, etc.
  - Metaphor: Gesture recognition, Speech recognition, etc.

- Output:

  - Device: Paper, screen, speakers, etc.
  - Metaphor: Animation, AR, etc.

§1.2 Definitions

Storage medium

- Derived from the used storage device:

  Which device is used to store the information?

- Non-electronic storage devices:
  - Paper
  - Microfilm
  - ...

- Electronic storage devices :
  - Magnetic tape
  - Floppy discs
  - Hard drives
  - CD-ROM
  - ...

§1.2 Definitions

Transmission medium

- Derived from the medium used to transmit the information continuously:

    Which medium is used to transmit the information?

- Wired transmission:
    - Coaxial cable
    - Twisted Pair
    - Glass fiber
    - ...
- Radio transmission

§1.2 Definitions

Conclusion

➡ In general, **media** are means for storage, transmission, and/or representation of information.

➡ The notion of the **perception medium** is the appropriate notion **media** in the context of multimedia information processing.

➡ We will use this notion in the sequel of this lecture.

▪ A **multimedia system** is characterized by

- computerized manipulation, representation, storage, and transmission of independent information,

- which is coded in at least one continuous or discrete medium,

- using multiple communication channels („seeing" and „hearing").

§1.2 Definitions

➡ Challenges:

- Amount/rate of data:

  - Storage
  - Transmission
  - Processing

- Integration (combination, navigation):

  - Simple for images and text (links, image maps, etc.)
  - Occasionally for videos (links)
  - Hard for audio (telephone menu)

Goals

- What is the difference between perception medium, representation medium, presentation medium, storage medium, and transmission medium?

- Which notion of media is usually used in the context of multimedia information processing?