# Multimedia

- what  is multimedia.
- It also supplies an overview of multimedia software tools, such as video editors and digital audio programs

# multimedia

- applications that use multiple modalities, including text, images, drawings (graphics), animation, video, sound including speech, and **interactivity.**

# Multimedia and Computer Science

- Graphics, HCI (**human-computer interaction**), visualization, computer vision, data compression, graph theory, networking, database systems --- all have important contributions to make in multimedia at the present time.

- Multimedia involves multiple modalities of text, audio, images, drawings, animation, and video.
- Examples of how these modalities are put to use:

1. Video teleconferencing.
2. Distributed lectures for higher education.
3. Tele-medicine.
4. Co-operative work environments.

5. Searching in (very) large video and image databases for target visual objects.
6. " Augmented" reality: placing real-appearing computer graphics and video objects into scenes.
7. Including audio cues for where video-conference participants are located.
8. Building searchable features into new video, and enabling very high- to very low-bit-rate use of new, scalable multimedia products.

9. Making multimedia components editable.
10. Building "inverse-Hollywood" applications that can recreate the process by which a video was made.
11. Using voice-recognition to build an interactive environment, say a kitchen-wall web browser.

# History of Multimedia:

1. **Newspaper: perhaps the *first mass communication medium,*** uses text, graphics, and images.
2. **Motion pictures:** conceived of in 1830's in order to observe motion too rapid for perception by the human eye.
3. **Wireless radio transmission:** Guglielmo Marconi, at Pontecchio, Italy, in 1895.
4. **Television:** the new medium for the 20th century, established video as a commonly available medium and has since changed the world of mass communications.

# History of Multimedia:

5. The **connection** between **computers** and ideas about **multimedia** covers what is actually only a short period:

- 1945 - Vannevar Bush wrote a landmark article describing what amounts to a hypermedia system called **Memex.**
- 1960 -Ted Nelson coined the term hypertext.

- 2000 - WWW size was estimated at over 1 billion pages.

# Hypermedia and Multimedia

- A **hypertext** system: meant to be read nonlinearly, by following links that point to other parts of the document, or to other documents

⊡ **HyperMedia:** not constrained to be text-based, can include other media, e.g., graphics, images, and especially the continuous media | sound and video.

- The World Wide Web (WWW) | the best example of a hypermedia application.

⊡ **Multimedia** means that computer information can be represented through audio, graphics, images, video, and animation in addition to traditional media.

# Overview of Multimedia Software Tools

- software tools available for carrying out tasks in multimedia are:
  1. Music Sequencing and Notation
  2. Digital Audio
  3. Graphics and Image Editing
  4. Video Editing
  5. Animation
  6. Multimedia Authoring

# 1.Music Sequencing and Notation

- ***Cakewalk:*** *now called Pro Audio.*

  - The term sequencer comes from older devices that stored sequences of notes ("events", in MIDI [**Musical Instrument Digital Interface**]).

  - It is also possible to insert WAV files and Windows MCI commands (for animation and video) into music tracks (MCI is a ubiquitous component of the Windows API.)

- ***Cubase:*** another sequencing/editing program, with capabilities similar to those of Cakewalk. It includes some digital audio editing tools.

- ***Macromedia Soundedit:*** mature program for creating audio for multimedia projects and the web that integrates well with other Macromedia products such as Flash and Director.

# 2.Digital Audio

- tools deal with accessing and editing the actual sampled sounds that make up audio:
- **Adobe Audition** (formerly **Cool Edit**) is a powerful, popular digital audio toolkit that emulate a professional audio studio, including multitrack productions and sound file editing, along with digital signal processing effects.
- **Sound Forge** Like Audition, Sound Forge is a sophisticated PC-based program for editing WAV files.
- **Pro Tools: a** high-end integrated audio production and editing environment . It offers MIDI creation and manipulation; powerful audio mixing, recording, and editing software.

# 3. Graphics and Image Editing

- **Adobe Illustrator**: a powerful publishing tool from Adobe. Uses vector graphics; graphics can be exported to Web.
- **Adobe Photoshop**: the standard in a graphics, image processing and manipulation tool.
  - Allows layers of images, graphics, and text that can be separately manipulated for maximum flexibility.
  - Filter factory permits creation of sophisticated lighting-effects filters
- **Macromedia Fireworks**: software for making graphics specifically for the web.
- **Macromedia Freehand**: a text and web graphics editing tool that supports many bitmap formats such as GIF, PNG, and JPEG.

# 4. Video Editing

- **Adobe Premiere**: an intuitive, simple video editing tool for nonlinear editing, i.e., putting video clips into any order:

- Video and audio are arranged in "tracks".
- Provides a large number of video and audio tracks, super-impositions and virtual clips.
- A large library of built-in transitions, filters and motions for clips => effective multimedia productions with little effort.

- **Adobe After Effects:** a powerful video editing tool that enables users to add and change existing movies. Can add many effects: lighting, shadows, motion blurring; layers.

# 4. Video Editing

- **Final Cut Pro**: a video editing tool by Apple; Macintosh only.
- **CyberLink PowerDirector**: PowerDirector produced by CyberLink Corp.
  - is by far the most popular nonlinear video editing software.
  - It provides a rich selection of audio and video features and special effects
  - easy to use.
  - It supports all modern video formats (AVCHD 2.0, 4K Ultra HD, and 3D video)
  - It supports 64-bit video processing
  - it is not as “programmable” as Premiere.

# 5. Animation

- **Multimedia APIs:**

- **Java3D:** API used by Java to construct and render 3D graphics, similar to the way in which the Java Media Framework is used for handling media files.

    1. Provides a basic set of object primitives (cube, splines, etc.) for building scenes.

    2. It is an abstraction layer built on top of OpenGL or DirectX (the user can select which).

- **DirectX** : Windows API that supports video, images, audio and 3-D animation
- **OpenGL**: the highly portable, most popular 3-D API.

# 5. Animation

- **Animation Software (Rendering Tools):**

- **3D Studio Max:** rendering tool that includes a number of very high-end professional tools for character animation, game development, and visual effects production.
  - **Softimage XSI:** a powerful modeling, animation, and rendering package used for animation and special effects in films and games.
  - **Maya**: competing product to Softimage; as well, it is a complete modeling package.
  - **RenderMan**: rendering package created by Pixar.

# 5. Animation

- **GIF Animation Packages :**

- simpler approach to animation, allows very quick development of effective small animations for the web.

- GIFs can contain several images, and looping through them creates a simple animation.

- Linux also provides some simple animation tools, such as **animate**.

# 6. Multimedia Authoring

- Tools that provide the capability for creating a complete multimedia presentation, including interactive user control, are called **authoring** programs.

- **Macromedia Flash:** allows users to create interactive movies by using the score metaphor, i.e., a timeline arranged in parallel event sequences.

- **Macromedia Director**: uses a movie metaphor to create interactive presentations. It is very powerful and includes a built in scripting language, **Lingo**, that allows creation of complex interactive movies.

# 6. Multimedia Authoring

- **Authorware:** a mature, well-supported authoring product based on the **Iconic/Flow-control** metaphor.

- **Quest:** similar to Authorware in many ways, uses a type of flowcharting metaphor. However, the flowchart nodes can encapsulate information in a more abstract way (called **frames**) than simply subroutine levels.