Outline

- Multimedia concept
- Tools for Multimedia communication
  - Software
  - Hardware
- Advanced coding standards
- Applications
What Is Multimedia

*Multimedia* is any combination of text, graphic, sound, animation and video that is delivered by computer. When you allow the user to control what and when these elements are delivered, it is *interactive multimedia*. 
Multimedia Software

- Familiar Tools
- Multimedia Authoring Tools
- Elemental Tools
Familiar Tools

- **Word Processors**
  - Microsoft Word
  - WordPerfect

- **Spreadsheets**
  - Excel

- **Databases**
  - Q+E Database/VB

- **Presentation Tools**
  - PowerPoint
A multimedia authoring tool is a program that helps you write multimedia applications. A multimedia authoring tool enables you to create a final application merely by linking together objects, such as a paragraph of text, an illustration, or a song. They are used exclusively for applications that present a mixture of textual, graphical, and audio data.

With multimedia authoring software you can make video productions including CDs and DVDs, design interactivity and user interface, animations, screen savers, games, presentations, interactive training and simulations.
Types Of Authoring Tools

- Card- or Page-based Tools
- Icon-based Tools
- Time-based Tools
In these authoring systems, elements are organized as pages of a book or stack of cards. The authoring system lets you link these pages or cards into organized sequence and they also allow you to play sound elements and launch animations and digital videos.

Page-based authoring systems are object-oriented: the objects are the buttons, graphics and etc. Each object may contain a programming script activated when an event related to that object occurs.

EX: Visual Basic
Icon-based, event-driven tools provide a visual programming approach to organizing and presenting multimedia. First you build the flowchart of events, tasks and decisions by using appropriate icons from a library. These icons can include menu choices, graphic images and sounds. When the flowchart is built, you can add your content: text, graphics, animations, sounds and video movies.

EX: Authorware Professional
Time-based authoring tools are the most common of multimedia authoring tools. In these authoring systems, elements are organized along a time line. They are the best to use when you have message with the beginning and an end. Sequentially organized graphic frames are played back at the speed that you can set. Other elements (such as audio events) are triggered at the given time or location in the sequence of events.

EX: Animation Works Interactive
Elemental Tools

Elemental tools help us work with the important basic elements of your project: its graphics, images, sound, text and moving pictures.

Elemental tools includes:

- Painting And Drawing Tools
- Cad And 3-D Drawing Tools
- Image Editing Tools
- OCR Software
- Sound Editing Programs
- Tools For Creating Animations And Digital Movies
- Helpful Accessories
Painting and drawing tools are the most important items in your toolkit because the impact of the graphics in your project will likely have the greatest influence on the end user.

Painting software is dedicated to producing excellent bitmapped images.

Drawing software is dedicated to producing line art that is easily printed to paper. Drawing packages include powerful and expensive computer-aided design (CAD) software.

Ex: DeskDraw, DeskPaint, Designer
CAD (computer-aided design) is a software used by architects, engineers, drafters, artists, and others to create precision drawings or technical illustrations. It can be used to create two-dimensional (2-D) drawings or three-dimensional modules. The CAD images can spin about in space, with lighting conditions exactly simulated and shadows properly drawn. With CAD software you can stand in front of your work and view it from any angle, making judgments about its design.

Ex: AutoCAD
Image editing applications are specialized and powerful tools for enhancing and retouching existing bitmapped images. These programs are also indispensable for rendering images used in multimedia presentations. Modern versions of these programs also provide many of the features and tools of painting and drawing programs, and can be used to create images from scratch as well as images digitized from scanners, digital cameras or artwork files created by painting or drawing packages.

Ex: Photoshop
Often you will have printed matter and other text to incorporate into your project, but no electronic text file. With Optical Character Recognition (OCR) software, a flat-bed scanner and your computer you can save many hours of typing printed words and get the job done faster and more accurately.

Ex: Perceive
Sound editing tools for both digitized and MIDI sound let you see music as well as hear it. By drawing the representation of the sound in a waveform, you can cut, copy, paste and edit segments of the sound with great precision and making your own sound effects.

Using editing tools to make your own MIDI files requires knowing about keys, notations and instruments and you will need a MIDI synthesizer or device connected to the computer.

Ex: SoundEdit Pro
Animations and digital movies are sequences of bitmapped graphic scenes (frames), rapidly played back. But animations can also be made within an authoring system by rapidly changing the location of objects to generate an appearance of motion.

Movie-making tools let you edit and assemble video clips captured from camera, animations, scanned images, other digitized movie segments. The completed clip, often with added transition and visual effects can be played back.

Ex: Animator Pro and SuperVideo Windows
No multimedia toolkit is complete without a few indispensable utilities to perform some odd, but repeated tasks. These are the accessories. For example a screen-grabber is essential, because bitmap images are so common in multimedia. It is important to have a tool for grabbing all or part of the screen display so you can import it into your authoring system or copy it into an image editing application.
Multimedia Hardware
Peripherals

• Input devices

• Output devices

• Storage devices

• Communication devices
  - Modems
  - Network Interfaces
Input Devices

• Keyboards And Mice
• Scanners And Digital cameras
• MIDI Keyboards
• Touch screens   Trackballs   Tablets
• Voice recognition systems

• Infrared remotes
Continue...

- Magnetic Card Encoders And Readers

- Video cameras
Output Devices

- Monitors
- Speakers
- VR helmet and VR immersive display
- Video Devices
Storage Device

- Syquest drives
• CD-ROM Drives
• Magneto-optical drives

Laserdisc Player
Advanced Multimedia Coding Standards

- **Still Picture Coding:** JPEG 2000
- **Video Coding:** MPEG-4
- **Multimedia Content Description Interface:** MPEG-7
- **Speech Coding Standards:** ITU G.729
- **Audio Coding Standards:** MPEG-4
- **Text compression standards**

There is not a single algorithm for it but the most popular schemes belong to Lempel-Ziv (LZ) family.
Multimedia Applications

- Education and training
- Business/Office
- Home
- Operation
- Public