

Multimedia Technology (IT-204-F)

Section A Introduction to multimedia

Lecture 3

Multimedia Authoring Tools

Multimedia Authoring Tools

- Multimedia Authoring : These are the tools which provide the capability for creating a complete multimedia presentation, including interactive user control, are called authoring tools/programs.
- Some of the examples are:
 1. Macromedia Flash.
 2. Macromedia Director
 3. Author ware
 4. Quest.

One can also say that multimedia authoring is the creation of multimedia productions, sometimes called **Movies** or **Presentations**. As we are interested in computer science, we are mostly interested in **interactive applications**.

Introduction

- Multimedia authoring tools provide the framework for organizing and editing the elements of a multimedia project.
- Authoring software provides an integrated environment for combining the content and functions of a project.
- It enables the developer to create, edit, and import data.

Authoring system in multimedia

- In multimedia authoring systems, multimedia elements and events are often regarded as objects.
- Objects exist in a hierarchical order of parent and child relationships.
- Each object is assigned properties and modifiers.
- On receiving messages, objects perform tasks depending on the properties and modifiers.

Authoring tools capability

- Authoring tools should possess the following capabilities:
 1. Interactivity
 2. Playback
 3. Editing
 4. Programming / Scripting
 5. Cross Platform
 6. Internet Playability
 7. Delivery/Distribution
 8. Project organization

Features of authoring tools

- Editing and organizing features.
- Programming features.
- Interactivity features.
- Performance tuning and playback features.
- Delivery, cross-platform, and Internet playability features.

Editing and organizing features

- Authoring systems include editing tools to create, edit, and convert multimedia elements such as animation and video clips.
- The organization, design, and production process for multimedia involves storyboarding and flowcharting.
- Visual flowcharting or overview facility illustrates project structure at a macro level.

Programming features

- Visual programming with icons or objects is the simplest and easiest authoring process.
- Visual authoring tools such as Authorware and IconAuthor are suitable for slide shows and presentations.

Interactivity features:

- Interactivity gives the end user control over the content and flow of information in a project.
- Simple branching is the ability to go to another section of the multimedia production.

Interactivity features cont:

- Conditional branching is an activity based on the results of IF-THEN decisions or events.
- Structured language supports complex programming logic, subroutines, event tracking, and message passing among objects and elements.

- Achieving synchronization is difficult, considering that performance of the different computers used for multimedia development and delivery varies.
- Authoring system should facilitate precise timing of events.
- It should enable developers to build a part of a project and then test it immediately.

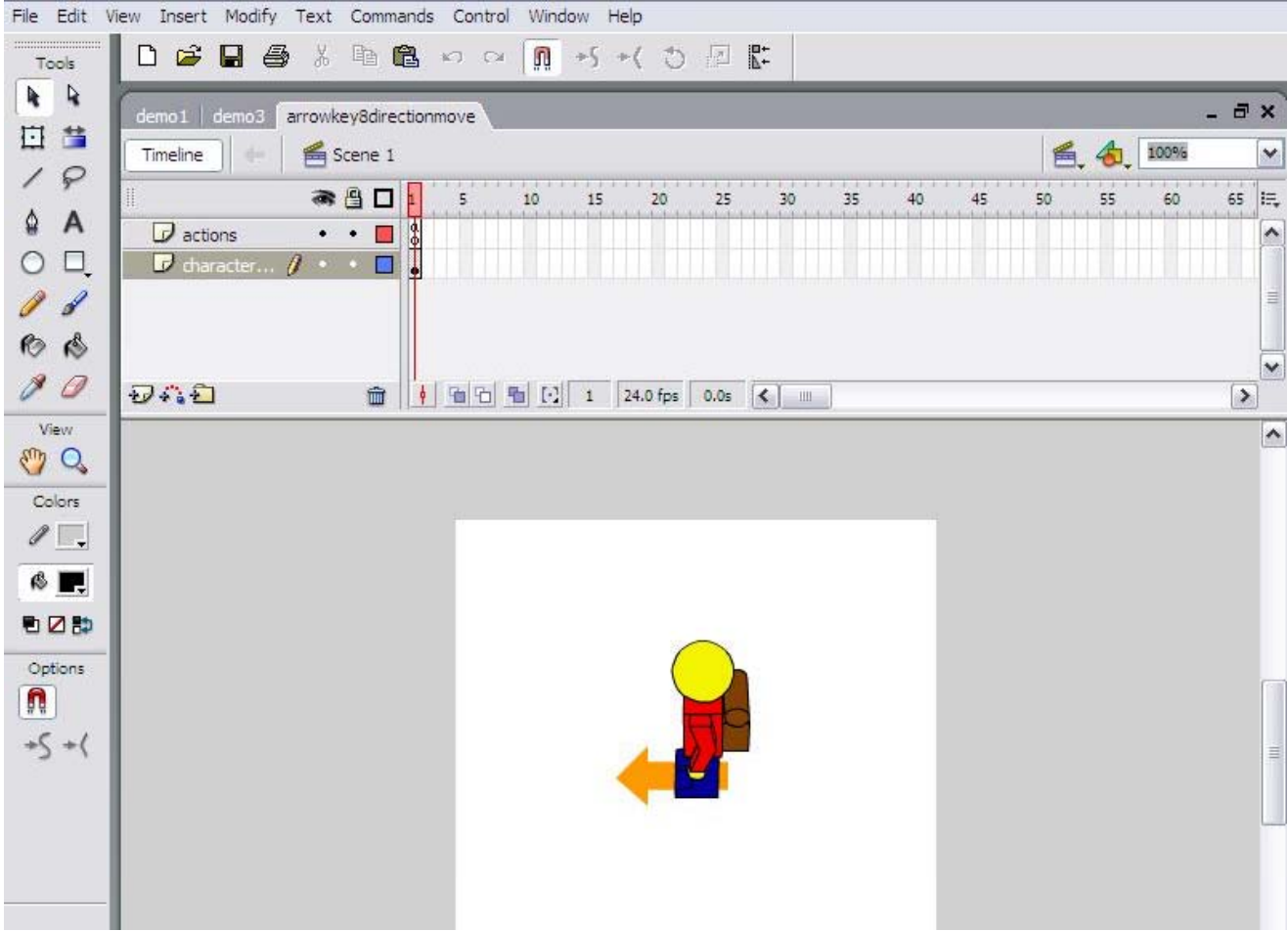
Types of authoring tools

- Card- and page-based tools.
- Icon-based, event-driven tools.
- Time-based tools.

Card- and page-based authoring systems

- Card- and page-based authoring systems provide a simple and easily understood metaphor for organizing multimedia elements.
- It contains media objects such as buttons, text fields, and graphic objects.
- It provides a facility for linking objects to pages or cards.

Card based authoring system example:



– Example of authoring tools

- HyperCard (Mac)
- ToolBook (Mac / Windows)

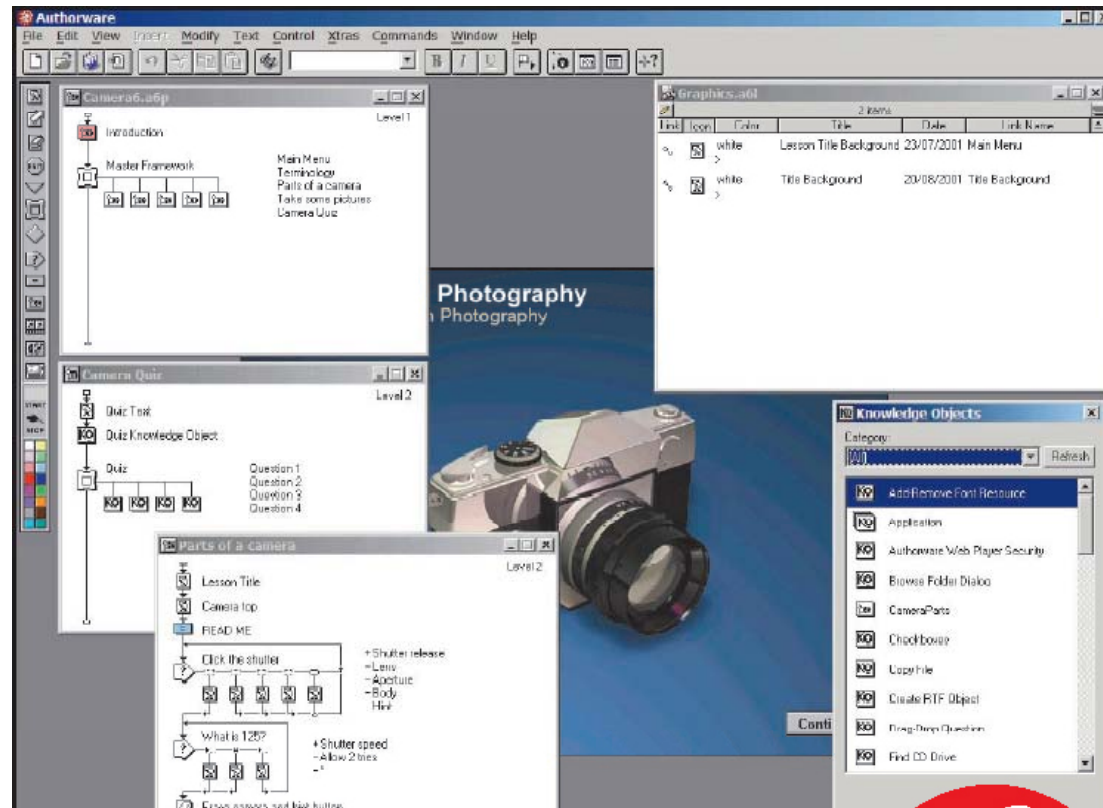
Icon-based, event-driven tools.

- Icon-based, event-driven tools provide a visual programming approach to organize and present multimedia.
- Multimedia elements and interaction cues are organized as objects in a flowchart.
- Flowchart can be built by dragging appropriate icons from a library, and then adding the content.

– examples of authoring tools

- Authorware(Mac/Windows)
- IconAuthor (Windows)

Icon based authoring system example:



Time-based authoring tools

- Time-based tools are best suited for messages with a beginning and an end.
- Some time-based tools facilitate navigation and interactive control.
- Macromedia's Director and Flash are time-based development environments.

- Example:- Macromedia Director / Flash
(Mac/Windows)

- **Some of the technologies which we will focus on:**

1. Multimedia Authoring Metaphors.
2. Multimedia Production
3. Multimedia Presentation
4. Automatic Authoring.

1. **Multimedia Authoring Metaphors:** Authoring is the process of creating multimedia applications. Most authoring programs use one of several authoring metaphors, also known as authoring paradigm.

Some common authoring metaphors are:

- a. **Scripting Language metaphor:** The idea here is to use a special language to enable interactivity and allow conditional, jumps, loops, functions, macros e.g. open script language
- b. **Slide Show metaphor:** Slide shows are by default a linear presentation. Although tools exist to perform jumps in slide shows, very few practitioners use them.
e.g. Power Point, Image Q.

- c. **Hierarchical Metaphor:** Here user controllable elements are organized into a tree structure. Such a metaphor is often used in menu driven programs.
- d. **Iconic/Flow control metaphor:** Graphical icons are available in toolbox, and authoring proceeds a flowchart with icons attached.
e.g. Authorware by Macromedia.

Some other types are:

1. Frame Metaphor
2. Card/Scripting Metaphor.
3. Cast/Score Scripting metaphor.

- **Multimedia Production:** A Multimedia project can involve a host of people with specialized skills. Multimedia production can easily involve an art director, graphics designer, production artist, user interface designer, sound designer, 2D and 3D animator.

The final part is the design phase which includes prototyping and testing. Some multimedia designers use an authoring tool. User testing is of course extremely important before the final development phase.

- **Multimedia Presentation:** This section includes some effects to keep in mind for presenting multimedia content.
 - a. **Graphics Style:** Many presentations are meant for business displays, rather than appearing on the screen. Human visual dynamics are considered in regard to how such presentations must be constructed.
 - b. **Color principles and Guidelines:** Some color schemes and art styles are best combined with a certain theme or style. A general hint is not to use too many colors.

c. Fonts: For effective visual communication, large fonts(18 to 36 points) are best, with no more than 6-8 lines per screen.

d. Animation

e. Video Transition: indicates a change to next session.

- Some of the technical design issues on which one should focus are:

1. Computer platform (Windows, UNIX/Linux etc.)

2. Video Format and Resolution.

(NTSC, PAL, SECAM) 1280X1024, 32 bit

3. Memory and Disk space requirements.

4. Delivery Methods- CDs, DVDs, Handwritten, Printouts, or E-Mail

- Automatic Authoring: By this term one can mean that either an advanced helper or a mechanism to facilitate creation of more useful multimedia document for existing sources.

Some important terms which one should know are:

- a. Hypermedia Document: Generally three steps are involved in producing document meant to be viewed non linearly:

Information generation or capture.

Authoring

Publication.

Authoring is a major aspect among the three.

- b. Externalization Vs Linearization

Includes hyperlinks which allows us the freedom to partially mimic the authors thought.

- c. Semiautomatic migration of Hyperlink.

- d. Hyperimages

Reference: Ch2, Fundamentals of Multimedia, Ze-Nian Li, pearson

- Some other type of authoring tools
 1. Card or Page based tools
 2. Icon based, event driven tools
 3. Time based and presentation Tools.
- **Professional Development Tools:** In addition to all hardware equipments described earlier, developers also need software tools for building multimedia applications.
 - a. **Text Editing Tools :** These tools are used to write a letter, invoice, user manual for a project and other documents. These tools are most often tools for any multimedia project.

e.g. Word pad, MS Word, Open Office Word.

- **Features of Text editing tools:**

1. Opening Existing Files, creating new files, saving it on some storage device and printing.
2. Find or replace the text from a document of multiple pages, cut, copy, paste of a selected document or whole file.
3. Insert page numbers on top, bottom or centre of the page, insert data, symbol, writing, formula and equation, insert comment on document.
4. Format the font of the text, making columns in the document, changing background color.
5. Checking the document for spelling and grammar, protect the document.
6. Making tables with variable numbers of columns and rows, sort the table and change the style of the table.

b. **Presentation Tools** : Computer based presentation technology is used to communicate more efficiently with the students, business delegates, sponsors and the clients. Presentation tools are currently the single largest application for multimedia in business.

Presentation tools allows a great variety of delivery modes. The main presentation tools are:

- Microsoft PowerPoint
- Corel Presentation
- Macromedia Director
- Adobe Acrobat

Some of the Features of MS PowerPoint:

1. You can create a new presentation or open the existing one.
2. While creating the new document, you can also take help of the wizard which will guide you to make it.
3. It has option to make various slide layouts with different color schemes.
4. You can apply various animatic styles and slide transition methods.

c. Painting and Drawing tools: These are perhaps the most important thing for all the multimedia projects. Painting and Drawing are generally inspired by the beauty in people, natural or living and non living things.

Features:

1. All the drawing tools have the GUI with menu, tool bars and dialogue box.
2. Tools to draw a straight line, rectangular area, circle and basic shapes.
3. Pencil draw freehand with a pencil and different color selection options.
4. Eraser tools
5. Support for test of different size, shape and type.
6. Good color schemes with different options.
7. Paint brush tool.

d. Image Editing Tools: An image is a spatial representation of an object. Image editing tools are required to reshape the existing images. The image editing tools can be used to create an image from scratch as well as image from scanner, digital cameras, files or from other painting and drawing tools.

e. Animation Tools: An animation is to show the still images at a certain rate to give it visual effects. The visual effects might be time varying position, shape, color or change in orientation or focus. A computer based animation is performed by a computer with various graphical tools.

e.g. 2D and 3 D Animator, Flash, Image Forge.

f. Plug-ins : A plug in is a separate module that behaves as though it is a part of the web browser.

e.g. Apple Quick Time, Adobe Acrobat Reader, Macromedia Flash Player

g. Sound Editing Tools: Sound is a key component in editing. The presence of sound greatly enhances the effect of a presentation.

e.g. Sound Edit pro, Audio edit deluxe, Audio Editor Pro, Goldwave digital audio editor.

h. Video Editing Tools: In this collection of video material is either compiled and altered from its original form to create a new version.

Types:

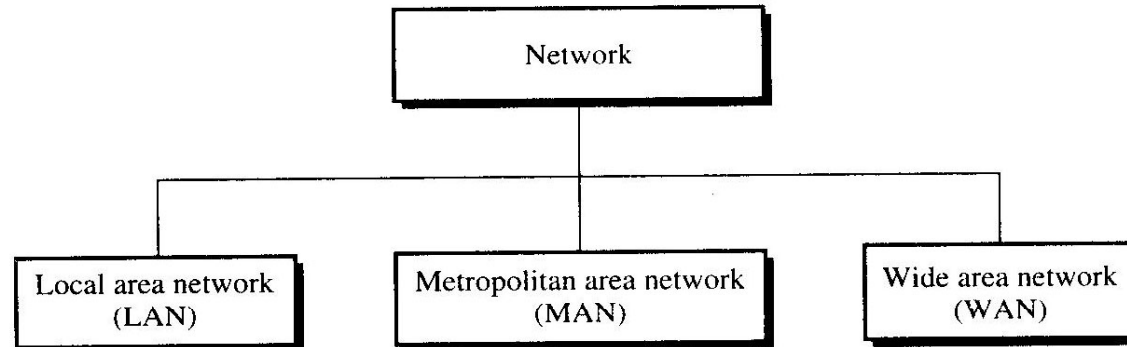
Linear Editing: follows a mechanical process, employs the use of camcorder, VCR, etc.

Non-linear Editing: is almost digital. It works on the principle of cut and paste.

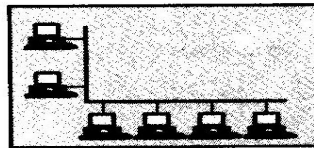
e.g. imovie, windows movie maker, video edit magic.

LAN and Multimedia

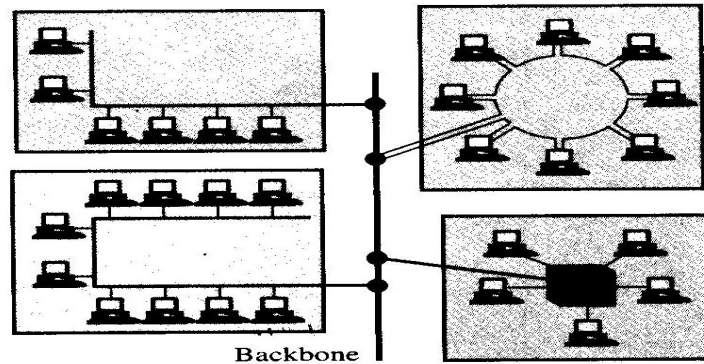
- Multimedia places greater demand on network and system.
- **Types of Network: LAN, WAN and MAN**



- **LAN-Local Area Network** is a network that covers a small geographical area, such as a home, office, or school. Similarly WAN refers to networks across cities and countries. Between LAN and WAN, the term MAN is sometimes used.
- LANs are designed to allow resources to be shared between personal computers or workstations. The resources to be shared can include hardware (e.g., a printer), software (e.g., an application program), or data.



a. Single building LAN



b. Multiple building LAN

- Most LANs use a broadcast technique. In LAN each PC is equipped with an interface that is connected to a cable. The PCs together with a file server and associated peripherals such as printer forms a node of the network.
- The most popular type of LANs present are **Ethernet** and **Token Ring**.
- **Some of the functions are:**
 1. Run conventional applications.
 2. Transferring files in form of packets.
 3. Playing games.
 4. Watching video/ listening audio.

- The main technology on which LAN technology works are **IEEE 802** reference model. **LAN Basically works in two different layers.**

OSI

Application

Presentation

Session

Transport

Network

Data Link

Physical

TCP/IP

Application

Transport

Internet IPv4, IPv6

Network Access Token Ring, Ethernet

Physical 100/10 Base-T, 1000 Base T

The two layers in which LAN technology generally works are **Physical** and **Data Link Layer**. In Particular DLL functionality is enhanced and is divided into-

1. **Medium Access Layer(MAC)** : This layer assembles or de assembles frames upon transmission and reception, performs addressing and error correction and regulates error control.

2. **Logical Link Layer (LLC)** : This layer performs flow and error control and MAC-Layer addressing. It also acts as an interface to higher layers.
- **Metropolitan Area Network (MAN)** : A metropolitan area network (MAN) is designed to extend over an entire city. It may be a single network such as a cable television network, or it may be a means of connecting a number of LANs into a larger network so that resources may be shared LAN-to-LAN as well as device-to-device.
 - A MAN may be wholly owned and operated by a private company, or it may be a service provided by a public company, such as a local telephone company. Many telephone companies provide a popular MAN service called Switched Multi-megabit Data Services (SMDS).

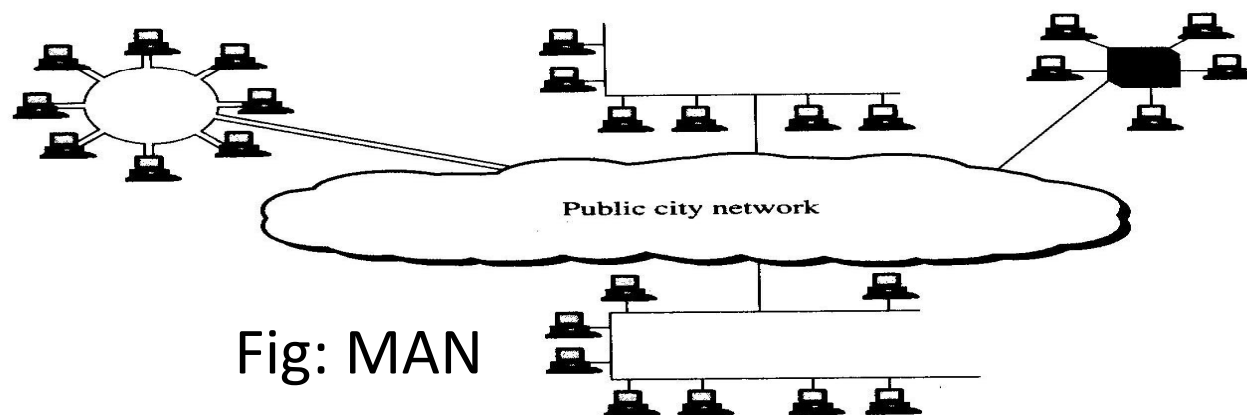


Fig: MAN

- **Wide Area Network (WAN):** A wide area network (WAN) provides long-distance transmission of data, voice, image, and video information over large geographical areas that may comprise a country, a continent, or even the whole world
- In contrast to LANs (which depend on their own hardware for transmission), WANs may utilize public, leased, or private communication devices, usually in combinations, and can therefore span an unlimited number of miles.
- A WAN that is wholly owned and used by a single company is often referred to as an enterprise network.

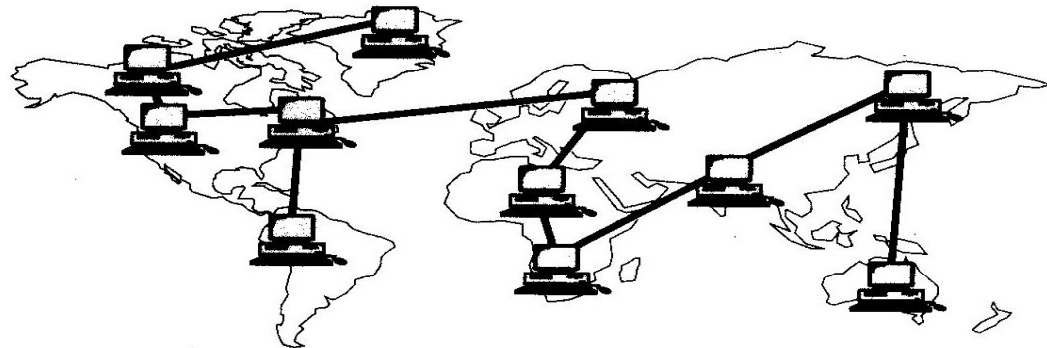


Fig: WAN

Following are some of the active IEEE 802 subcommittees and the areas they define:-

1. 802.1 (Higher layer LAN Protocol): The relationship between the 802.X standards and the OSI reference model, the interconnection and management of the LANs.
2. 802.2 (LLC): The general standard for logical link control.
3. 802.3 (Ethernet) : Medium access control and physical layer specifications for Ethernet.
4. 802.5- Token Ring
5. 802.10- Security
6. 802.11-Wireless LAN
7. 802.14- Cable TV Based broad band communication network
8. 802.16- Broadband wireless.

- **Ethernet:** It is a standard for physical layer access developed by Xerox. It is a packet switched bus-network. It is the most popular LAN till date. This is a key standard given by IEEE 802.3 committee in 1982. In this all devices are logically connected in a line to a single cable.
- **Types of Ethernet:**
 1. Ethernet (Traditional) 10 Mbps
 2. Fast Ethernet 100 Mbps
 3. Gigabit Ethernet 1 Gbps

One major drawback is that this scheme is unsuitable to some extent for multimedia applications that require the transmission of large amounts of time-dependent data like video in a continuous stream.

- **Some of the Ethernet Standards are:**
 1. **10 Base-5:** suitable for network that consists of a small number of workstations and peripherals. Maximum length is 500 meter and maximum diameter is 2500 meter.
 2. **10 Base-T:** This works on Star Topology. Each node connected to a central hub. It is the best selling network till date for multimedia networks.
 3. **Isochronous Ethernet (IsoENET) :** Developed by National Semiconductors and IBM for a single wiring scheme. It gives a 6 M bits/sec service.
 4. **100 Base T:** It is compatible with CSMA/CD. It works on 100 M bits/sec in segment over 100 meter in length in star shaped configuration with a central repeater/hub with a network diameter of 250 meters.
 5. **100 Base VG:** Developed by HP and AT & T Bell Labs. It has all the features of the existing LANs along with added security and dedicated bandwidth. It runs on voice grade(VG)

- **LAN Software**
- LAN operating system is required to operate on the LAN system. It has basically two aspects:
 - a. Server Software**
 - b. Workstation Software**
- There are various types of LAN operating system. Some popular LAN operating system are:
 - Novel Netware, Ethernet
 - Curves, ArcNet
 - LAN Server, Omni Net
 - PC Net, IBM PC LAN
 - Etherlik Plus, etc.

APPLICATIONS

- Image Processing
- Image Enhancement
- Medical Imaging

Scope of Research

- New authoring software.
- VLAN.