Multimedia

chapter (1)

introduction

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History of Multimedia

1. **Newspaper:** Newspaper were perhaps the first mass communication medium to employ Multimedia -- they used mostly 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 Pon-tecchio, Italy, in 1895.
4. **radio waves :** in 1901 Gugliemo Marconi detected radio waves beamed across the Atlantic. Initially invented for telegraph

History of Multimedia

5. **Television:** the new medium for the 20th century, established video as a commonly available medium and has since changed the world of mass communications.
6. **The connection between computers and ideas about multimedia covers what is actually only a short period.**

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.**

History of the WWW

- **1960s- The Generalized Markup Language (GML) for IBM was developed.**
- **1986 - The ISO released a final version of the Standard Generalized Markup Language (SGML).**
- **1990 - The HyperText Markup Language (HTML) invented, and the HyperText Transfer Protocol (HTTP).**

- **1993 - NCSA released an alpha version of Mosaic based on the version by Marc Andreessen for X-Windows -the first popular browser.**
- **1994 - formed the Netscape Communications Corporation.**
- **1998 - The W3C accepted XML version 1.0 specifications as a Recommendation - the main focus of the W3C and supersedes HTML.**

HTTP (HyperText Transfer Protocol)

- **HTTP: a protocol that was originally designed for transmitting hypermedia, but can also support the transmission of any file type.**
- **The URI (Uniform Resource Identifier): an Identifier for the resource accessed,**
- **ex. the host name, always preceded by the token http://".**

HTML (HyperText Markup Language)

- **HTML: a language for publishing Hypermedia on the World Wide Web - defined using SGML** (Standard Generalized Markup Language)

2. The next generation of HTML is XHTML(Extensible Hypertext Markup Language) **- a reformulation of HTML using XML.**

Example of HTML

```
<HTML> <HEAD>
<TITLE>
A sample web page.
</TITLE>
<META NAME = "Author" CONTENT = "Cranky
   Professor">
</HEAD> <BODY>
<P>
We can put any text we like here, since this is
a paragraph element.
</P>
</BODY> </HTML>
```

Information can be conveyed in the form of text, still images, Web pages, slideshow presentations, video, sound or interactive tooltips.

Measuring Angles

You can measure the angle between a reference point and some other position using the cross-hairs and the angle read-outs.

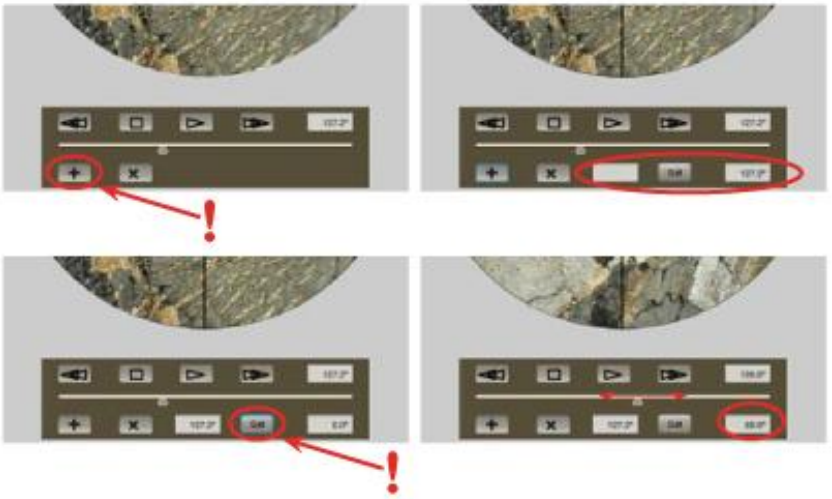
1. Click on the button with an upright cross (+) on it to show the cross-hairs. This will cause a new button, labelled Set to appear, together with two text fields: the one to the left of the Set button (the base angle read-out) will be blank. The other (the angular difference readout) will show a copy of the current angle of rotation.

2. Use the slider or stepping arrows to rotate the slide to the position you want to use as the reference for your measurement.

3. Click the Set button. The current angle will be copied to the base angle readout and the angular difference readout will be set to zero.

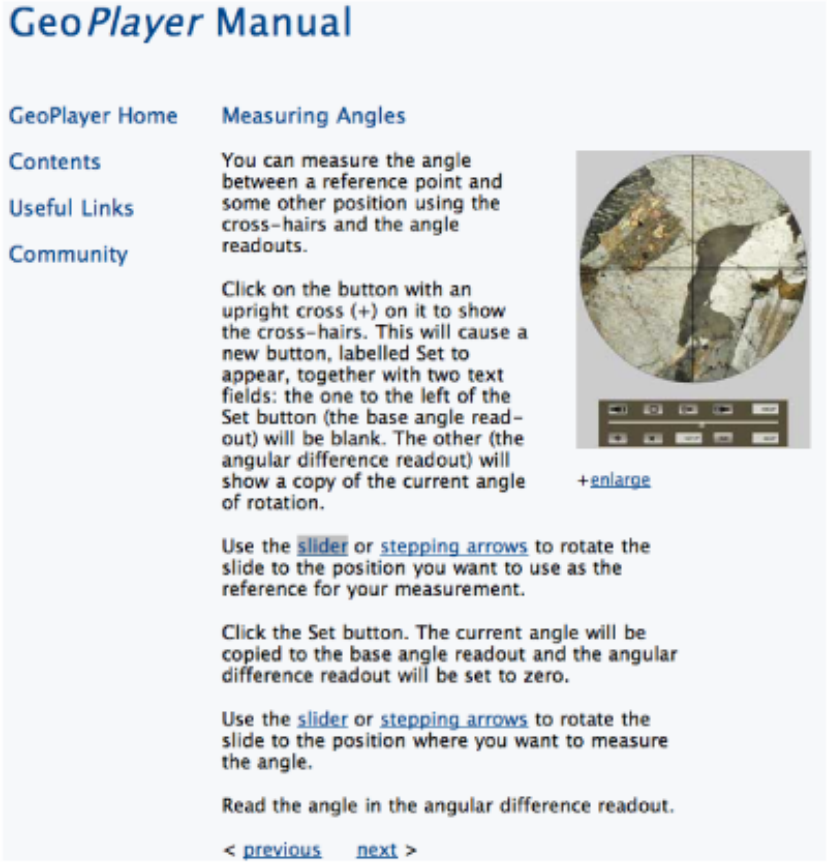
4. Use the slider or stepping arrows to rotate the slide to the position where you want to measure the angle.

5. Read the angle in the angular difference readout.



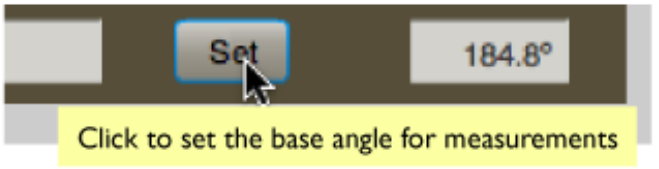
Text

Images



A Web page

Video



A tool tip

There is a fundamental distinction between time-based and static media: time-based media exhibit change over time; static media do not.

Media

The different media : text , images, sound , video …

Multimedia

- **Multimedia : the combination of text, animated graphics, video, and sound--presents information in a way that is more interesting and easier to grasp than text alone.**

- **It has been used for education at all levels, job training, and games and by the entertainment industry.**

Time-based media

Any data that changes meaningfully with respect to time can be characterized as time-based media. Audio clips, MIDI sequences (Musical Instrument Digital Interface)**, movie clips, and animations are common forms of time-based media. Such media data can be obtained from a variety of sources, such as local or network files, cameras, microphones, and live broadcasts.**

Video, animation and sound are time-based media.

Still images and text are usually considered to be static media.

Multi Media Elements

- Text.
- Graphics.
- Animation.
- Sound.
- Images.
- Videos.

Each medium has its own characteristics, leading to distinctive strengths and weaknesses.

Always choose the most appropriate medium for your purpose.

Text

- Text remains vital to multi media applications. This is because text still an effective way to communicate.
- Text is used as headlines, subtitles and captions in addition to supplying contents.
- Text-based menus and buttons help guide users through the multimedia applications.

Emphasis can be added to text by varying font size, style and color.

E.g: font size

32- point

28- point

24- point

Text

Font style: refers to the specific characteristics of the font. The characteristics that can be defined for fonts are italic, bold, bold italic, subscript, superscript, blink and underline.

Special effects and drop shadows give the feeling of 3D which can be done by WordArt.

Fonts

A font is a set of character shapes, called glyphs.

Fonts


ABCDEFGHIJKLMNOP
QRSTUVWXYZ
abcdefghijklmnopqr
stuvwxyz
1234567890
A B C D E F G H I J K L M N
O P Q R S T U V W X Y Z
a b c d e f g h i j k l m n o p q
r s t u v w x y z
1 2 3 4 5 6 7 8 9 0
A B C D E F G H I J K L M N
O P Q R S T U V W X Y Z
a b c d e f g h i j k l m n o p q r s
t u v w x y z
1 2 3 4 5 6 7 8 9 0
ABCDEFGHIJKLMNOPQRS
TUVWXYZ
abcdefghijklmnopqrst
uvwxyz
1234567890
A small selection of fonts

Fonts

Many aspects of layout must be controlled when text is displayed.

Fonts

MOLOREET VOLOREET EX-EROS
Etum adionse feuis non henim ipsusting etum iriure magna feu feummy nis augiam, quat.
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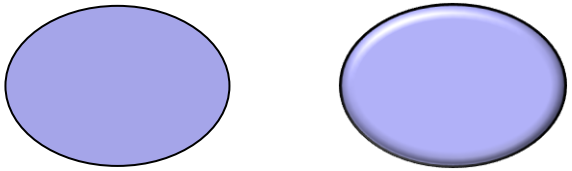
Layout and typography

Graphics

- **2D and 3D graphics**



- **Balancing graphics is essential, adding just the right graphics and just the right number of graphics, helps the user to learn and retain information on less time with less effort.**

Types of graphics

1. **Clip arts: they are commercially prepared and come packaged with many applications or can be downloaded form the internet.**
2. **Charts: can convey a great deal of information in a very limited space. Pie charts and bar graphs are good examples of charts.**
3. **Photographs: they can be digitized through a color scanner or taken directly with digital camera.**
4. **Stock photographs: they are collections of digital photographs available on CD-ROM or can be downloaded from the internet.**
5. **Hypermedia: they are any graphic or multimedia object that serves as a link to additional information about a topic.**

Animation

- It refers to graphic images that change or move.
- Animation can convey information, add visual interest or draw attention to important information or links in multi-media applications.
- Animation are commonly used in advertising and marketing on the web because movement grabs attention.

Sound:

- **In multimedia applications digitized sound is called audio.**

Audio can be obtained by capturing sound into PC using a microphone or can be played from a synthesizer.

Video

- **Video can do a great deal to enhance a presentation, illustrate a proper technique or advertise a new product.**
- **Video files are photographic images played at speeds that make it appear as if images are in full motion.**
- **Video files are incredibly large because of the huge number of images (frames) to give the appearance of natural motion.**

Ex.: 1 second of uncompressed video running at 30 frames/second requires 30 MB of storage.

- **Bandwidth: is the amount of data a communication channel can carry.**

- **In order to efficiently communicate video files, they must be compressed or reduced in size for storage, then they are transferred and then decompressed for use.**

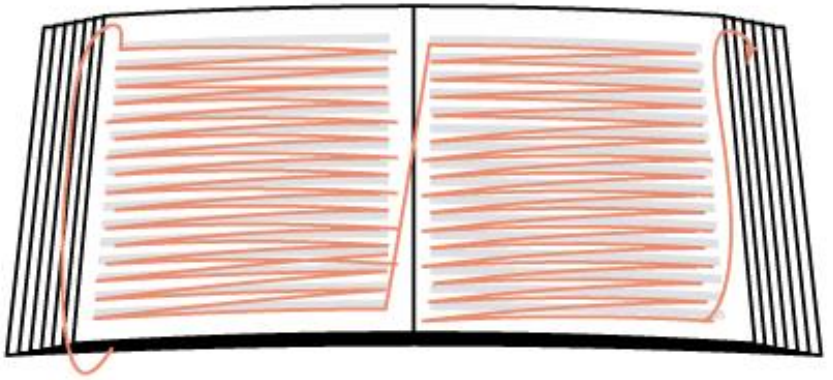
Media and Multimedia

- **Media maybe combined into multimedia**

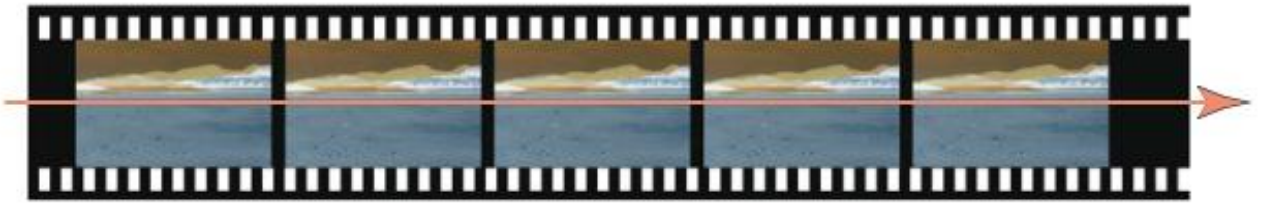
  Media can be represented in a digital form that can be stored and manipulated in a computer they can readily be combined

- **Digital media can be manipulated as data by program.**
- **Users can interact with digital multimedia in novel ways leading to non- linear structures.**

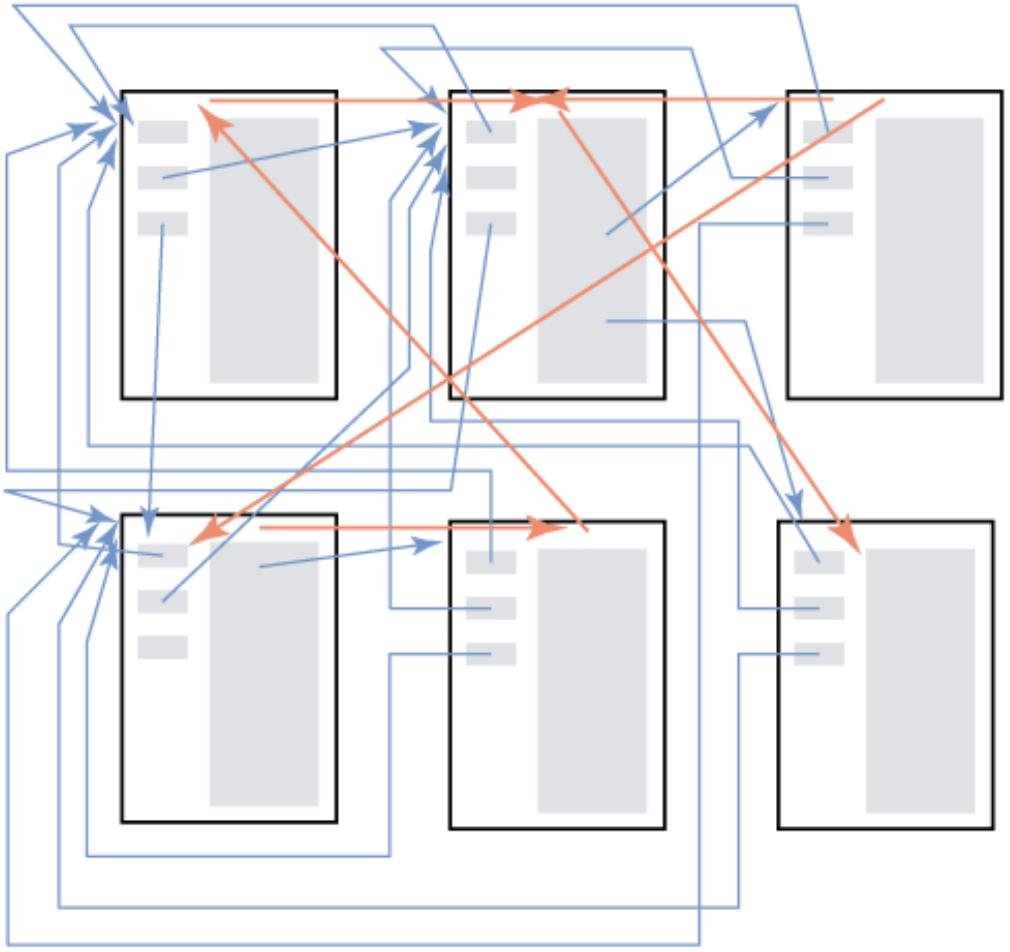
Book: physical arrangement of text and pages implies a linear reading order.



Film: fixed order of frames defines a single playback sequence.

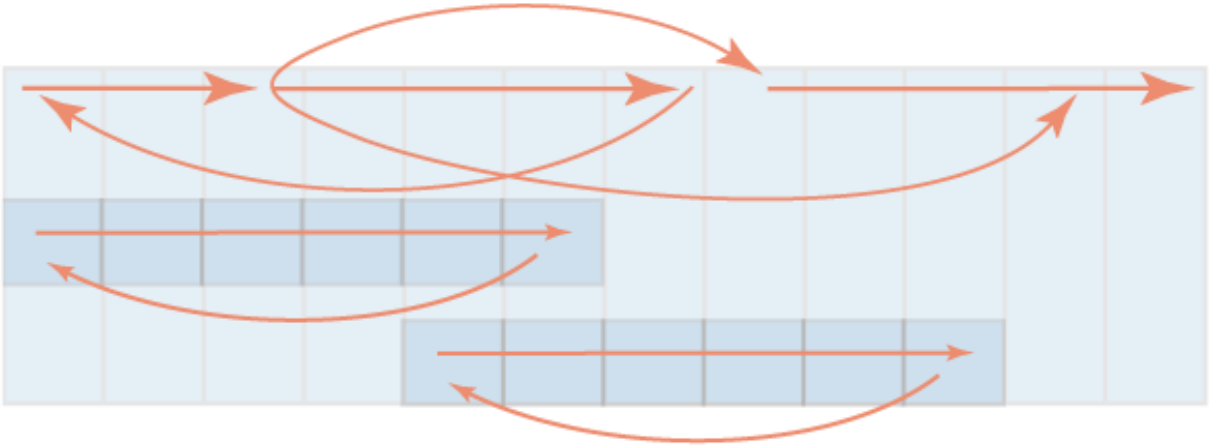


Linear structures in conventional media



Hypermedia: links between pages permit multiple arbitrary reading orders.

Non-linear structures (1)



Flash: jumps between frames controlled by interactivity; independent movie clips play in parallel.

Non-linear structures (2)

Digital multimedia can interact with other sorts of data and computation, serving as a user interface to databases and applications.

Multimedia

- **Multimedia is a relatively immature technology . Although its adoption is accelerating with the increasing power of computer system.**

Overview of Multimedia Software Tools

The categories of software tools briefly examined here are:

1. **Music Sequencing and Notation**
2. **Digital Audio**
3. **Graphics and Image Editing**
4. **Video Editing**
5. **Animation**
6. **Multimedia Authoring**

Music Sequencing and Notation

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

  Supports General MIDI

  Provides several editing views (staff, piano roll, event list) and Virtual Piano

  Can insert WAV files and Windows MCI commands (animation and video) into tracks

- **Cubase: another sequencing/editing program.**
  - A better software than Cakewalk Express
  - Intuitive Interface to arrange and play
  - Wide Variety of editing tools including Audio
- **Macromedia Soundedit:** mature program for creating audio for multimedia projects and the web that integrates well

Digital Audio

Digital Audio tools deal with accessing and editing the actual sampled sounds that make up audio:

- **Cool Edit**
- **Sound Forge**
- **Pro Tools**

Graphics and Image Editing

- **Adobe Illustrator:** a powerful publishing tool from Adobe.Uses vector graphics; graphics can be exported to Web.
- **Adobe Photoshop**
- **Macromedia Fireworks**
- **Macromedia Freehand**

Video Editing

- **Adobe Premiere:** an intuitive, simple video editing tool for nonlinear editing, i.e., putting video clips into any order:
- **Adobe After Effects:** a powerful video editing tool that enables users to add and change existing movies.
- **Final Cut Pro:** a video editing tool by Apple; Macintosh only.

Animation

- **Multimedia APIs** (application programming interface):
- **Java3D**
- **DirectX :** is a collection application programming interface (APIs) for handling tasks related to Multimedia .
- **OpenGL :** (Open Graphics Library)

Multimedia Authoring

- **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 - very powerful and includes a built in scripting language, Lingo, that allows creation of complex interactive movies.

Compression

Compression must often be applied to media data.

Compression may be lossless or lossy.

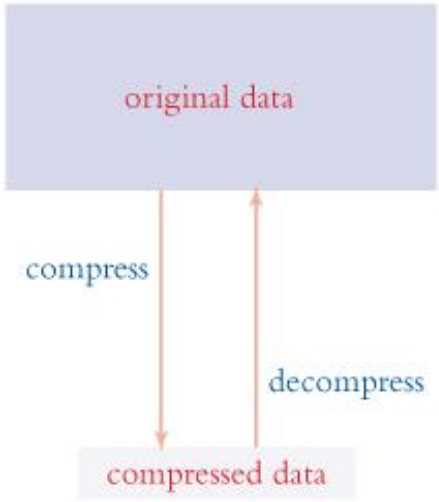
Lossless algorithm : has the property that it is always possible to decompress data that has been compressed and retrieve an exact copy of the original data.

RLE (run-length encoding)
LZW (Lempel–Ziv–Welch**)**

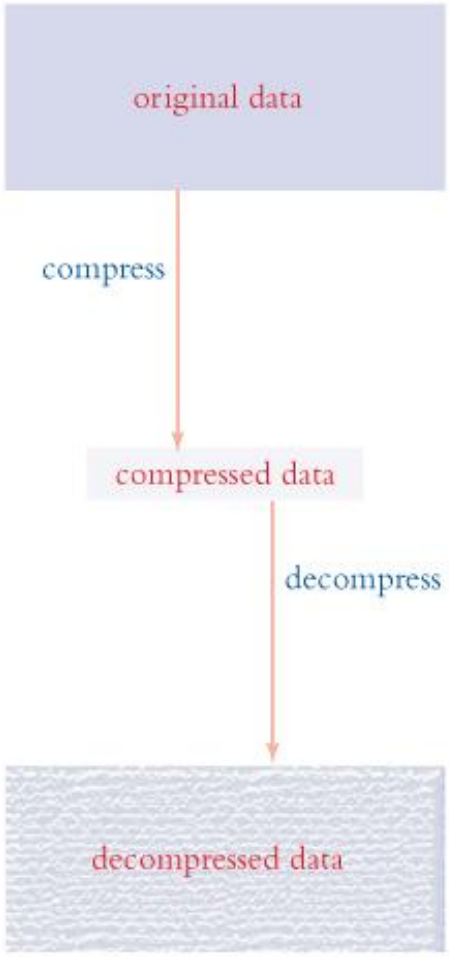
Lossy algorithm : means some data has been discarded in the compression process and cannot be restored. So that the decompressed data is only an approximation to the original.

JPEG format use Lossy algorithm

Compression



Lossless compression



Lossy compression

Compression

Different compression algorithms are applicable to different types of media data. Their effectiveness depends on the characteristics of the data itself.

References

1. Chapman & Chapman Digital Multimedia Wiley 2009
2. Fundamentals of Multimedia Li & Drew Prentice Hall 2003