

MULTIMEDIA FINAL EXAM SUMMARY

TOPIC 5 (TEXT)

- Text can be defined as a combination of letters that form sentences or words to explain or discuss a topic which is known as text information.
- Information Technology, text is a sequence of readable alphabets and constructed words that can be encoded into a computer readable format such as ASCII format.

Text files that can be imported

1. Rich Text (.rtf):

- a) This is available as a „Save As" function in most popular word processing documents. It is a character formatting file that facilitates file sharing between applications and via the Internet.
- b) With RTF file, all formatting done with text style (Bold, italics, underline), justification (left, right center and full) and typeface (typeface - size and type) are retained. In other words, when imported into different applications, RTF files will appear exactly like when it was first produced in the word processing document.

2. ASCII(American Standard Code for Information Interchange) Text Format (.txt):

- a) This type of text is developed as the standard text on all computers. With this type of text file, whatever format used will be lost when you "Save."
- b) Texts files are normally saved as unformatted text and may be accessed through the ‘Save As’ option that is available in all word processing documents. It is also a native file format in the Windows Notepad program.

Factors or ways than can make text visually attractive are:

1. use of suitable type and size of fonts; and
2. how text is displayed on the screen.

Ways text is used in multimedia applications:

Plain Text:

There are many examples of text usage that is, any form plaintext alphabet. Text_files are developed using word processing that later can be imported_into multimedia authoring programs. If an application requires a long text document, then the document can be imported in the form of Rich Text Format or ASCII text format and inserted into the

presentation. Nowadays, most popular authoring packages such as Macromedia Director, has its own text tools for editing and typing text.

Paragraph Text:

A paragraph is a text block, usually containing more than one sentence. Methods can be used to format paragraph text are left-justify, right-justify, Centre and full-justify.

Bullet Text:

Bullet text is a sentence that explains concepts or as help signs and usually use a bullet symbol. The bullet symbols comprise of graphics, symbols, numbers or letters that combine, move or explain the text.

Scrolling Text:

Scrolling text is a feature provided by some authoring tools to facilitate reading and control of large text blocks in multimedia applications.

Navigational Text:

Multimedia applications currently combine interactive elements into presentations so that users have some control over the navigational parts. The Internet is an example of text used as interactive navigational control.

Animation and Special Effects:

You can make text more dramatic, interesting and funny when you use graphics and text manipulation software such as Flying Fonts and Fontographer. Software packages such as Director and Pixar Tapestry, can make text turn, rotate and zoom with relative ease by using 2D and 3D animation to create dynamic movements.

Typeface and font

A typeface is a family of graphic characters that usually includes many type sizes and styles. A font is a collection of characters of a single size and style belonging to a particular typeface family.

There are two methods that can be used to make a large amounts of text less overwhelming or minimal are:

Hypertext:

This method only provides text as a path for users to obtain more related information. This technique is widely used in web pages.

Other methods:

Besides hypertext, you can use related graphics, audio, video or animation to replace a few paragraphs of text with the same information.

TOPIC 6 (GRAPHICS)

- Agnew and Kellerman (1996) stated that, "Graphics are lines, circles, boxes, shadows, colors, and others, made by a drawing program."
- Computer graphics can be divided into two categories which are vector graphics and bitmap graphics.

Graphics are used in multimedia applications in the following circumstances:

1. **Complementary element:** Graphics are usually used as background and texture, whereby it acts as a complement towards the intended meaning through its display.
 2. **Main focus:** Logos, images, paintings, figures and photographs in an application play a vital role in the delivery of the meaning or concept of the multimedia application.
 3. **Object**
- **Vector graphics** are also known as object oriented graphics or structured graphics. Vector graphics are formed from lines that follow the mathematical equations called vector. Changes in size or color, the quality of graphic remains the same.

Advantages and disadvantages of vector graphics. SELF-CHECK

ADVANTAGES	DISADVANTAGES
1.Requires only a small size data for image representation.	1. Not realistic because of the computer technology.
2.Quality of the Vector graphics remains the same even though the size and the position change.	2.The more complex the image created the bigger the file size and the slower the display.
3. Requires only a small storage space.	

- **Bitmap graphics** is also known as raster image or bit map image. Bitmap images are produced from dots arranged specifically in metric form. These dots are known as pixels (Pixel = picture + element). This pixel image is known as bitmap image.

Advantages and disadvantages of bitmap graphics.

ADVANTAGES	DISADVANTAGES
<ul style="list-style-type: none"> • Produces real quality image. • Capable of storing a large amount of information. • Capable of being modified with a high quality modifier. 	<ul style="list-style-type: none"> • Depends on resolution. • Enlargement of image size will produce a blurred image.

Vector graphics VS Bitmap graphics:

Vector graphics are regularly used in technical areas such as CAD/CAM (Computer Aided Design/ Manufacture), scientific modelling, architecture, arts design and others. On the other hand, for an image that needs to look realistic, a bitmap application is encouraged. Bitmap images include photographs, photorealistic images and background texture.

Graphics file formats

1. **.bmp**: Window's Bitmap; This BMP's file is a file format that is most efficiently used in the Windows environment.
2. **.gif**: Graphics Interchange Format (GIF); developed by CompuServe to be used in computer networks. GIF is one of the most common graphics format used for images on websites.
3. **.jpg**: JPEG's image; named after the standard committee that developed it which is the Joint Photographic Experts Group. It aimed to be a graphics format that is not platform specific (Platform Independent). This is the most popular graphics file format used on websites.
4. **.pcd**: Photo CD; based on Photo CD technology from Kodak. Consists of five types of sizes for each picture, from "wallet" to "poster" size.
5. **.pict**: Standard format for an image in the Macintosh environment. It is used for the development of cross-platform.
6. **.png**: Portable Network Graphic format; is called ping .png is developed as a patent and license-free format and is an alternative format to GIF.
7. **.tiff**: Tagged Image File Format (TIFF); is developed by Aldus Corporation and consists of many file versions. Usually used in desktop publishing software packages and is a file format favoured by printing companies.

8. **.eps:** Encapsulated PostScript; is a file format used in PhotoShop and can contain both bitmap graphics and vector graphics. It is supported by many graphics programs, illustrations and layout pages. It is also used to transfer PostScript's language artworks between applications.

Sources of graphics

1. **Scanner:** A scanner is an equipment that is able to change images, text, drawings and photographs from analog to digital forms.
2. **Digital camera:** With a digital camera, we do not need a scanner. The captured images are in digital form and can be uploaded into a computer instantly.
3. **Clip art, and Stock photography:** The easiest way to obtain an image is through the use of ClipArt, and stock photography.
4. **Self-produced images:** With the aid of sophisticated graphics software available in the market, graphic designers can produce attractive images with unlimited creativity.

Graphic software

1. Adobe Photoshop
2. Adobe Illustrator
3. Macromedia Freehand
4. Microsoft Designer
5. AutoCAD
6. Paint Brush
7. Microsoft Paint

TOPIC 7 (INTRODUCTION TO ANIMATION)

- Animation originates from the Latin word which means "bring to life." According to the Dewan Bahasa dan Pustaka dictionary, animation is an act or process of making something seem realistic or alive.

Computer animation applications are:

1. Education
2. Medicine
3. Advertising
4. Chemistry
5. Architecture
6. Films, Entertainment and games

Two types of animation techniques are:

Traditional animation

These techniques were aimed at producing a more realistic and entertaining animation. In fact these techniques can and should be applied in the production of 3D animation.

- a. **Keyframes:** To save time and reduce the workload of the artists, the task of producing animation was distributed to more than one person. In order for this process to function smoothly, keyframes were referred to.
- b. **Tweeing:** Tweening is the process of producing an image or object in between the keyframes so as to give the illusion of movement.
- c. **Onion Skinning:** By drawing on transparent paper, the graphics artist can see the rough outline or the cell outline and use it as his guide for drawing or producing the next cell image.
- d. **Cell animation:** Cell animation employs the three major techniques which are the keyframes, tweening and onion skinning.

TOPIC 8 (COMPUTER ANIMATION)

Computerized animation uses computer to organize the frames and records them in the computer memory.

There are two categories of computer animation:

1. Two-dimensional animation (2D)
2. Three-dimensional animation (3D)

Types of 2D animations are:

- a. **Path animation:** Path animation only needs a specific path that has been predetermined.
- b. **Cell animation:** Cells that are hand drawn can be scanned into graphics software packages, colored and exported as suitable file formats to be animated in an animation software packages such as Macromedia Director.
- c. **Screen or object transition:** During a multimedia presentation, sometimes transitions on the screen or object are required for the audience to rest their eyes or to inform the audience visually that something is changing or going to happen on the presentation.
- d. **Font and icon animation:** Font animation refers to animation on fonts or selected characters.

3D animations

Main process involved in producing 3D animation is:

- a. Storyboard
- b. Modeling
- c. Mapping
- d. Lighting: Types are ambient light, directional light, positional light, spot light
- e. Rendering and animation

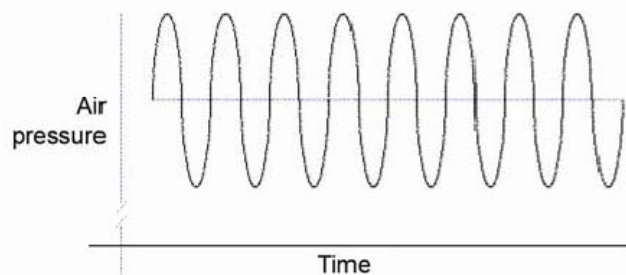
Special effects of animation are morphing and warping

- **Morphing:** Morphing is the process of transforming one image into another.
- **Warping:** Warping let you manipulate the images according to your taste.

The popular animation file formats are Macromedia Director (.DIR), Animator (.FLI, .FLC), and 3D Studio Max (max).

TOPIC 9 (AUDIO IN MULTIMEDIA)

Analog sound:



Two important features of sound waves are frequency and amplitude. Frequency refers to the number of cycles a sound wave creates in one second. Amplitude is the volume or loudness of the sound being produced.

Digital sound:

Computer recognizes sounds in digital format. Usually the computer will process data into electronic form and not from the physical movements in the air. All of you know for sure that sounds used in multimedia applications are in digital form. This involves the process of converting from analog to digital format where it is captured by the sound card and stored within the audio file. To enable it to be replayed, the audio stored in the numeric combinations must be converted again into analog format.

- **Audio Conversion:** The process of transforming analog sound into digital sound is performed by the analog converter (Analog-to-Digital Converter-ADC) which has been built-in inside the sound card.
- **Sampling:** The process by which an analog wave is captured by the sound card and then converted into digital format is known as digital sampling.

Roles played by audio in multimedia are warnings and reminders, background music, sound effects, narration and data that is related to sound.

Factors that considered when using audio are:

- a. **Compatibility:** The use of audio has indeed been proven in the sense that it increases the effectiveness of most multimedia applications.
- b. **Users:** When using audio you should also take into account your target audience.
- c. **Playback system:** Playback system is one of the conditions that should be taken into account during the use of audio.
- d. **Users controls:** Control of sound or audio includes the users rights to start the audio, on or off the audio, control the volume according to desire, or provide an alternative such as using text display to replace sound.

Advantages of Audio

The main advantage of audio is that it ensures the delivery of vital information. It also has the unique capacity to provide caution or reminder to the users about some specific information. The other advantages of audio is that it increases the multimedia attraction where music, narration or sound effects further enhance the multimedia application that was previously quite static. Good visuals and information would not be perfect if the music that accompanies does not match what is being conveyed. Sound has made video or animation more real and memorable.

Disadvantages of Audio

One of the most obvious disadvantages is overuse. Other disadvantages of audio are, it requires special equipment to generate high quality products.

TOPIC 10(AUDIO FORMATS AND SOFTWARE)

The common types of digital audio formats are:

1. **AIFF format (Audio Interchange File Format):** Used to store and send sound samples.
 2. **MP3:** This audio format is extremely popular now and it is often used to record a large number of songs and music onto compact discs.
 3. **AU:** AU audio format was specially created to be used on the Sun Microsystems workstation. It is a 16 bit audio format that is compressed and used for distribution via the Internet.
 4. **MIDI (Musical Instruments Digital Interface):** MIDI is a standard language used for communications between musical instruments and computers.
 5. **WAV:** A WAV file is the main and popular audio format in the Microsoft Windows operating system environment.
- Sources of audio files can be borrowed from pre-packages, purchases or borrowings, and from your own invention.
 - For the purpose of producing better audio with attractive special effects, sophisticated audio software are required such as Sound Forge and SoundEdit 16.

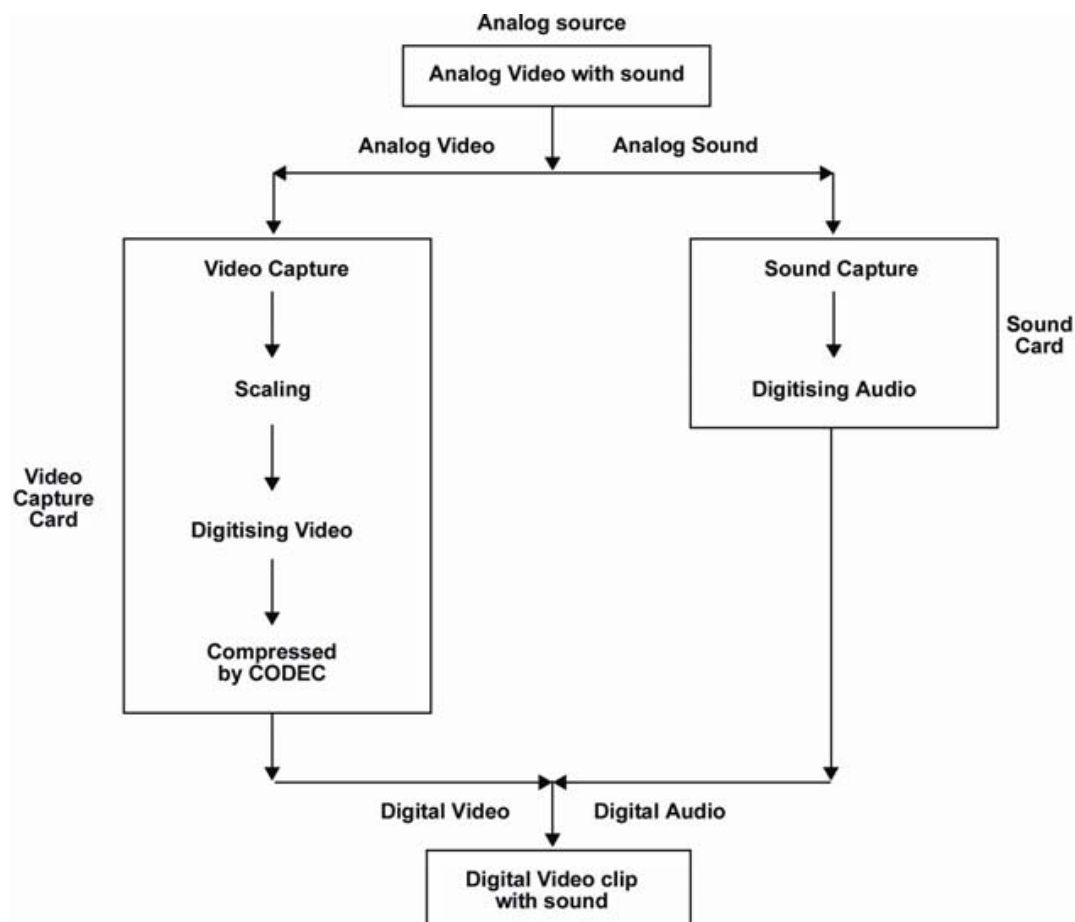
TOPIC 11(VIDEO IN MULTIMEDIA)

- Video is a digital media that shows the arrangement or sequence of static pictures that give an illusion as though we are looking at moving pictures. This illusion depends on two physiological phenomena called, “persistence of vision and flicker fusion”.
- Generally, there are two types of videos, which are analog video and digital video.
- **Analog video:** Analog video consists of video or a sequence of images produced by continuous analog waves.
- **Digital video:** Digital video consists of images with discrete values (binary digit 0 and 1). Unlike analog video which is continuous, every point on a digital image has an accurate value. The digital image on a computer comprises of individual dots known as pixels or pictorial elements. These collections of pixels form the image which is seen on the computer screen.

Basic components of video:

1. **Personal computer system:** A personal computer or desktop is needed to record or to produce a digital video.
2. **Video source:** You should ensure that your video's source is in good condition.
3. **Large storage:** You also need a hard drive with a large storage space and faster speed because video takes up a lot of memory space.
4. **Video capture card:** A video capture card is an add-on card required for digital video production.

Capturing and digitizing video and sound:



Advantages of digital video	Disadvantages of digital video
<ul style="list-style-type: none"> • Easy to edit video sequence. • Easy to add special effects. • The quality of the copied file is the same as the original file. • Better audio and image quality. • Long lasting. 	<ul style="list-style-type: none"> • Requires a storage device with large capacity. • Copies can be pirated. • Requires a powerful computer system for capturing and playback. • Requires knowledge of digital technology.

Factors that determine the file size of digital video:

1. **Screen size:** Basically, the bigger the screen size, the bigger the memory and the processing power required to play back the digital video on the computer.
2. **Frame rates:** The higher the frame rate of the digital video, the smoother the movement of the video and the larger the file size or the storage required for the video.
3. **Colors:** Colors make your video more attractive and realistic.
4. **Duration:** The duration of a digital video-clip will add or reduce the file size.

Generally, the method of compression is known as CODEC and it encompasses:

- a. **The process of compression:** Generally, compression occurs when a video film is stored or produced. The compression process changes video sequence that has been digitized in the form of pixel into mathematical equation.
- b. **The process of decompression:** The process of decompression converts back the mathematical equation to the original digital video.

There are two main methods of compression:

1. **Lossless Compression:** Lossless compression means that files that have been compressed can be decompressed exactly the same as the original file. This type of compression maintains the original image during both the compression process and decompression process. It is important especially if it involves text images. Text need to appear in its original state before and after file compression.
2. **Lossy compression:** Lossy compression on the other hand, eliminates some of the data of the image. Hence, this technique has a better compression ratio than

lossless compression. This method helps to reduce the digital video file size. However, the bigger the compression ratio, the lower the decompression quality of the resulting image. This type of compression is suitable for video because the small decrease in quality is hardly noticeable for moving images.

There are two more techniques of video compression:

1. **Intraframe compression:** occurs within its own frame.
2. **Interframe compression:** occurs between frames.

The role of video in multimedia are:

1. **Attracting attention:** Video is a media that attracts the users attention immediately because it provides visual satisfaction with colorful displays and attractive videos.
2. **Display of physical procedure:** Video can be used to show procedures or operation manuals that cannot be described by text or graphics alone.
3. **Scenario Presentation:** Sound and movement has made video a good and effective tool to depict a real life situation or scenario in our daily lives.
4. **Movement Analysis:** One of the special qualities of video, that is not available in other media, is its ability to pause an action, show an action in slow motion and fast mode. This quality makes video very useful for analysis.

Advantages of video:

1. Video can captivate the users: video comprises of various combinations of color, movements and sounds. Thus, it is very useful for marketing materials and promoting applications.
2. **Video can increase the memory of users.**
3. **Video can explain physical actions and complex relationships:** The video's ability to show real-time movements enables users to have a clear picture regarding a relationship or physical action compared to what is conveyed through descriptions or illustrations.
4. **Video can combine with other media:** Sounds, text, graphics and movements, can all be combined together with video, for use in a presentation. This is a core factor, as to why video is the most suitable media, for delivering complex information.

Disadvantages of video:

1. **Video production involves higher cost.**
2. **Video requires a large memory and storage space.**
3. **Video requires special equipment for production and presentation:**
Instruments such as cameras, lights and equipment for editing are required to produce a video.
4. **Video is not able to visually explain abstract concepts or static situations, effectively:** Video is specially used to show movements but it is not suitable for illustrations of abstract concepts, showing objects or static situations. In these circumstances, text or graphics can convey the abstract concepts more effectively than video.

TOPIC 12(VIDEO FORMATS AND SOFTWARE)*The four main formats and standards for broadcasting and video are:*

1. NTSC (National Television Standards Committee).
2. PAL (Phase Alternate Line).
3. SECAM (Sequentiel Couleur avec memoire).
4. HDTV (High Definition TV).

Different codec formats:

Video Compression Codecs	
Name of Codec	Purpose of Codec
AppleAnimation, AppleNone	Lossless storage but inefficient, see Photo JPEG
Cinepak	Medium quality CD ROM video, works on older computers; the most universal choice
H.261	Low quality videoconferencing
H.263	Medium quality videoconferencing
Intel Indeo 3	Medium quality CD ROM video, works on older computers
Intel Indeo Interactive	High quality CR ROM video, requires faster computers
Motion JPEG	General purpose video editing and storage
Photo JPEG	When used at 100% as a storage/transfer format, it creates significantly smaller files than animation
MPEG-1	High quality CD ROM video, requires special hardware or fast computers
MPEG-2	High quality DVD ROM video, requires special hardware or fast computers
MPEG-4	High-quality Web based video
Sorenson	High quality video intended for publication on the Web and CD-ROM on newer computers

(Reference: "Multimedia Literacy," Fred T. Hofstetter, 2001 : pg 335)

Main digital video file formats are:

1. **QuickTime:** QuickTime does not require a high cost as the files required to replay video clips in QuickTime format are circulated free of charge by Apple computer.
2. **Microsoft's Video for Windows:** The Microsoft's Video for Windows program is based upon the .AVI (Audio Video Interleave) file format where the audio and video is "interleaved." This enables audio and video to be played simultaneously.
3. **MPEG (Motion Picture Expert Group):** There are many MPEG versions in the market such as MPEG 1, MPEG-2 and MPEG-4. MPEG-1 is the original format designed for quality VHS pictures at CDROM data rate.

- Lately, the role of video has been receiving a lot of attention in multimedia systems. Including the video element in multimedia presentations is one of the effective ways to deliver information that other media failed to do. The reasons for this development are:
 - a. Demands from users for video;
 - b. Multimedia technology has progress to a stage where video is easily integrated into multimedia systems; and
 - c. The emergence of sophisticated hardware such as video capture cards, video RAM and AGP cards.