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Chapter 4 (1 or 2 Q)
Video and Animation

1) Explain Video.

Ans: Moving images that have been captured or created digitally by a computer is known as video.

→ Simply, video refers to moving picture accompanied by sound.

→ The video part of a multimedia application conveys a great deal of information in a short period of time.

→ Hence it is the most effective means of communication.

→ In multimedia applications, digital video is useful for displaying real-life things.

→ The extensions used by video files may be .mp4, .mkv, etc.

→ VLC media player, MX Player, etc are used to play videos.

2) Digitalization of a motion video

→ Before a picture or motion video can be processed by a computer or transmitted over a computer network, it needs to be converted from analog to digital representation.

→ This is called digitization of a motion video.

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3) Continuity of motion

-> Motion can be represented by showing the still image in rapid succession.

-> We can perceive continuous motion by showing still images at any frame rate faster than 15 frames per second.

-> video motion seems smooth and is achieved at only 30 frames per second.

-> There are several standards for motion videos.

4) Flicker effect.

-> Flicker is a periodic fluctuation in brightness between cycles displayed on video displays.

-> Flickers occurs on display (TVs) when they are driven a low refresh rate, allowing the brightness to drop for time intervals sufficiently long to be noticed by a human eye.

-> The marginal value to avoid flicker is atleast 50 refresh cycle per second.

-> When the refresh rate of frame is smaller, then the eye will notice the cutoff of light between the frames and there arises the flicker effect.

-> For continuous flickerfree motion, we need high refresh frequency.

-> movies, as well as television, apply some technical measures to work with lower motion frequencies.

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11 5) Explain the computer video format

Ans. The computer video format depends on the input and output devices for the motion video.

→ The output of the digitalized ~~video~~ motion video depends on the display device.

→ The most often used displays are raster displays.

→ A common raster display system architecture is shown below.

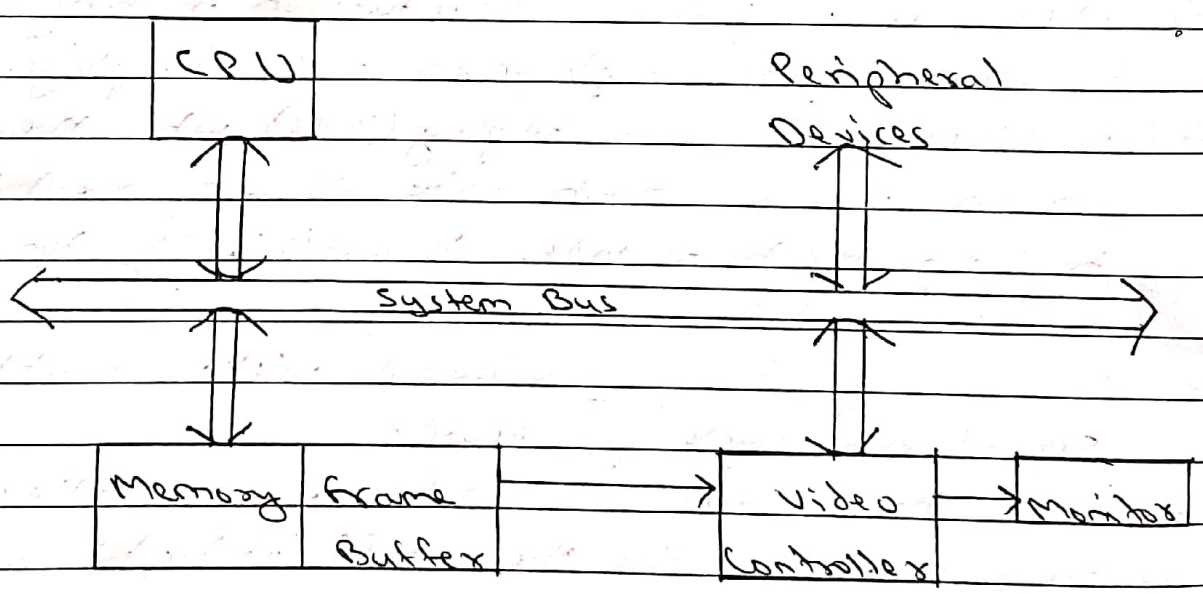

fig: A common raster display system architecture.

→ The video controller displays the ~~video~~ images stored in the frame buffer accessing the memory through different port.

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-> The constant refresh of the display is its most important task.

-> To avoid flicker effect, the video controller cycles through the frame buffer, typically 60 times/second.

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IIII 6) What is animation?

or

Discuss briefly about the concept of animation.

Ans: Animation means giving life to an object.

-> Computer animation is the process of modifying images in such a way that the sequence of images appears to be moving.

-> ~~In multimedia~~ Animation plays a number of frames per second to give the user the feeling of motion.

-> In multimedia applications, the animation is unique and quite popular.

-> Animation can be used in many areas like entertainment, computer aided design, scientific visualization, training, e-commerce, education, etc.

-> The extensions used by animation files are same as in video i.e .mp4, .mkv, etc.

-> VLC media player, MX player, etc are used to play animation.

-> These days animations are used mostly in movies and cartoons.

-> There are two types of animation. They are

i) 2D animation

ii) 3D animation

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i) 2D animation

-> It implies that the object is 2 dimensional.

-> 2D animation objects were created by traditional drawing method. and also by software.

-> less costly

-> implemented in advertisements, cartoons, e-learning courses, etc.

-> The Jungle Book, Simpsons are 2D animation movies.

ii) 3D animation

-> It implies that the object is in 3-dimensional

-> In 3D animation, everything is going to be done in available computer software.

-> It is costlier than 2D animation.

-> It is widely used in gaming, movies, simulation, etc.

-> The Incredibles, Toy Story are 3D animation movies.

Q) Difference between animation and video.

Ans: Animation is often employed in those instances where videography isn't possible.

-> Animation can better illustrate concept than video.

-> Example: Earth is revolving around its axis cannot be video graphed but can be shown through animation.

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7) Explain the principle of animation.
or
Characteristics of animation.

Ans: The principle of animation are:-

i) Anticipation
→ In anticipation, we make our audience prepare for action.
→ It helps to make our animation look more realistic.
→ Eg: Before hitting the ball through the bat, batman prepares for hitting the ball.

ii) Staging
→ Staging is used to make sure that the most important actions in the story are noticable.
→ This can be achieved through a combination of framing, lighting as well as ensuring that the backgrounds and other objects do not create distraction.

iii) Slow in - slow out
→ While performing animation one should always keep in mind that in reality objects takes time to accelerate and slow down.
→ Eg: It takes time for a vehicle to accelerate when it is started and similarly when it stops it takes time.

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iv) Follow Through {opposite of Anticipation}

→ It refers to the action which continues to move even after the completion of action.

→ It helps to create more ~~rela~~ realistic animation.

→ Eg. Even after throwing the ball, the movement of hands continues.

v) ~~Exa~~ Exaggeration

→ It is an important tool for animators to create drama by emphasizing actions/emotion or expression.

→ Used to create extremely cartoony movements so that viewers can enjoy.

vi) Appeal

→ Animated characters need to be visually and emotionally appealing, regardless of whether they are hero or not.

→ They should be easy to understand.

→ For the story to function we need to be engaged with the characters.

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IIIIII 8) Describe the various types of animation languages.

or

Explain the different types of animation language.

Ans: There are many different languages for describing animation, and new ones are constantly being developed.

→ They fall into 3 categories:

i) Linear-List Notations

→ In linear-list notations for animation each event in the animation is described by a starting and ending frame number and an action that is to take place.

Eg: 42, 53, B, ROTATE "PALM", 1, 30

It means, between frames 42 and 53 rotate the object called PALM about axis 1 by 30 degrees. ~~Take reference from table B.~~
Determine the amount of rotation at each frame from table "B".

ii) General-purpose Languages

→ Another way to describe animation is to embed an animation animation capability within a general-purpose programming language.

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→ The high level computer languages which are developed for the ~~normal~~ applications/software development now have the animation support features. Example: C++, Java, etc.

Example:

(grasp ~~ball~~ cube) : The ~~ball~~ cube becomes the current object

iii) Graphical languages

→ One problem with textual languages is inability to visualize the action by looking at the script.

→ Graphical animation languages describe animation in a more visual way.

→ These languages are used for expressing, editing and comprehending the simultaneous change taking place in an animation.

→ Example: AutoLAD.

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11 g) Describe the various methods for controlling animation.

Ans: Controlling animation is independent of the language used for describing it.

→ Animation control mechanisms can employ different techniques.

i) Full explicit control

→ It is the simplest ~~form~~ ~~of~~ method of animation control.

→ Here, the animator provides a description of everything that occurs in the animation, either by specifying simple changes, such as scaling, translation and rotation.

→ It is done by direct manipulation with mouse, joystick, etc.

ii) Procedural control

→ Here we write some procedure to control the object to animate according to our need.

iii) Constraint based system

→ Some objects in the physical world move in straight lines, but many objects move in a manner determined by other objects with which they are in contact.

→ This compound motion may not be linear at all.

→ Such ~~motion~~ motion can be modeled by constraints.

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iv) Tracking Live Action

-> If a object is rotating then we have to track the live action to find it's exact location.

-> So this, attach some sort of indicator to key points on a person's body.

v) Kinematics and Dynamics

-> It include's physics law like speed, velocity, friction, etc.

-> Kinematics refers to the position and velocity of objects.

-> Dynamics takes into account the physical laws that govern kinematics.

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10) What are the approaches that are used to transmit animation over computer network?

Ans: The transmission of animation over computer network may be using any one of two methods:

i) Symbolic representation

→ The symbolic representation of animation objects is transmitted together with the operation commands performed on the object, and at the receiver side the animation is displayed.

→ The transmission time is short.

→ However, the display time at the receiver takes longer.

ii) Pixmap representation

→ In this method the animation object is converted into ~~using~~ pixmap and then transmitted to the receiver.

→ In this case, the transmission time is longer in ~~comparison~~ comparison to symbolic representation, because the size of pixmap is larger than the symbolic.

→ But the display time is shorter at the receiver side.

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iii) Explain the different types of animation techniques with examples.

-> The different types of animation techniques are :-

i) Hand Drawn Animation
ii) 2D } Explained in Q.No.6
iii) 3D
iv) Stop Motion Animation
v) Computer Animation

i) Hand Drawn Animation / Traditional Animation.

-> It is done by an artist who draws each character and movement individually.
-> Draw the picture first, then color them, photograph each picture and animate them
-> Very time consuming and costly due to hours of labour involved.
-> Example: Old Disney movies i.e Bambi, Cinderella etc.

ii) Stop Motion Animation ~~Motion Graphics~~

-> Uses jointed figures or clay figures that can be moved to make motions.
-> The artists take photos of the individual movements ~~and~~ and then use computer software to animate.
-> Less expensive than other method.
-> Example: Robot chicken cartoon

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iii) Computer Animation

-> All characters and movements are generated using computer animation software.

-> It can also be very time consuming as they can get very complicated in movements and effects.

-> All characters are fully animated with no still pictures.

-> Can be very expensive because of the complexity.

-> Example: Toy Story, The Incredibles, etc.

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