Unit 5

Computer Animation

Animation refers to the movement on the screen of the display device created by displaying a sequence of still images. Animation is the technique of designing, drawing, making layouts and preparation of photographic series which are integrated into the multimedia and gaming products. Animation connects the exploitation and management of still images to generate the illusion of movement. A person who creates animations is called animator. He/she use various computer technologies to capture the pictures and then to animate these in the desired sequence. Animation includes all the visual changes on the screen of display devices. These are:

1. Change of shape as shown in fig:

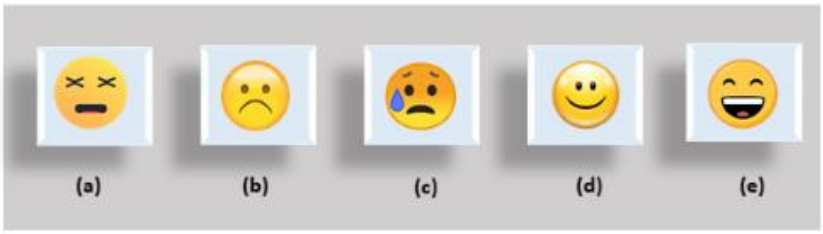


Fig: Change in Shape

2. Change in size as shown in fig:

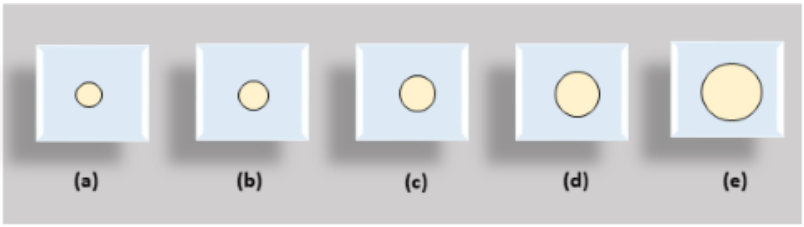


Fig: Change in Size

Design of Animation Sequences

Common Steps of designing the animation sequence are as given:

1) Layout of Storyboard: Storyboard layout is the action outline utilized to illustrate the motion sequence as a set of basic events which are to acquire place. This is the kind of animation to be produced that selects the storyboard layout. So, the storyboard comprises a set of rough sketches or a list of basic concepts for the motion.

2) Definition of Object: The object definition is specified for all participant objects in action. The objects can be explained in terms of fundamental shapes, related movements or movement with shapes.

3) Specification of Key Frame: this is the detailed drawing of the scene at an exact time in the animation sequence. Inside each key frame, all objects are positioned as per to time

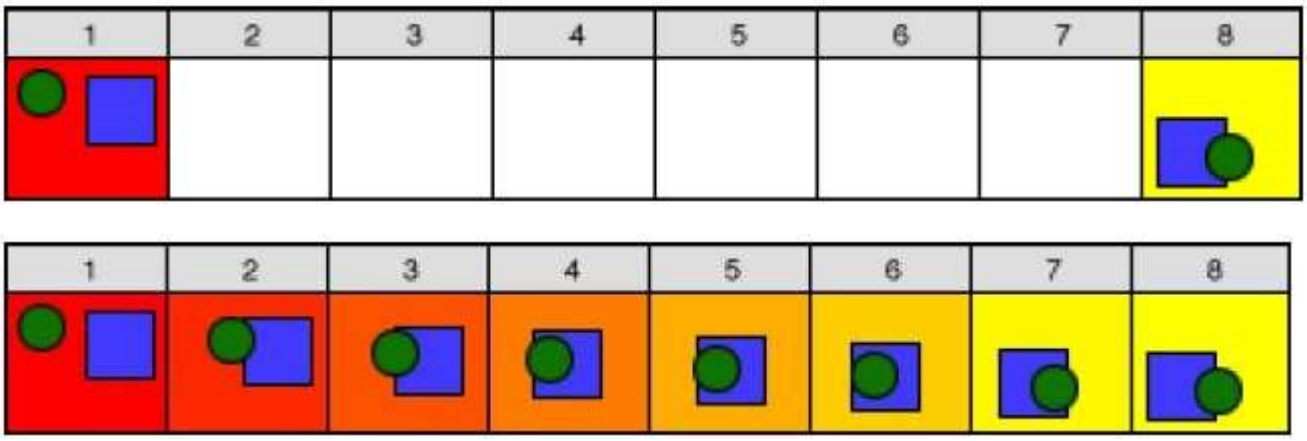
for that frame. Several key frames are selected at the extreme positions in the action; others are spaced hence the time interval among key frames is not as great. More key frames are given for intricate motion than for easy, slowly varying motions.

4) In-between frames Generation: In-among frames are the middle frames among the key frames. The number of among frames is based on the media to be utilized to display the animation. In common, film needs twenty-four frames per second, and graphic terminals are refreshed on the rate of 30 to 60 frames per second. Classically the time interval for the motion is set up hence there are 3 to 5 among for each pair of key frames. Based upon the speed identified for the motion, several key frames can be duplicated.

Key Framing

A keyframe is a frame where we define changes in animation. Every frame is a keyframe when we create frame by frame animation. When someone creates a 3D animation on a computer, they usually don't specify the exact position of any given object on every single frame. They create keyframes.

Keyframes are important frames during which an object changes its size, direction, shape or other properties. The computer then figures out all the in-between frames and saves an extreme amount of time for the animator. The following illustrations depict the frames drawn by user and the frames generated by computer.



Morphing: Morphing is an animation function which is used to transform object shape from one form to another is called Morphing. It is one of the most complicated transformations. This function is commonly used in movies, cartoons, advertisement, and computer games.

For Example:

1.Human Face is converted into animal face as shown in fig:

Raster Animations, Computer Animation Languages, Key Frame systems, Morphing

Raster Animations

On raster systems, real-time animation in limited applications can be generated using raster operations.

Sequence of raster operations can be executed to produce real time animation of either 2D or 3D objects.

We can animate objects along 2D motion paths using the color-table transformations.

- Predefine the object as successive positions along the motion path, set the successive blocks of pixel values to color table entries.

- Set the pixels at the first position of the object to „on" values, and set the pixels at the other object positions to the background color.

- The animation is accomplished by changing the color table values so that the object is „on" at successive positions along the animation path as the preceding position is set to the background intensity.

Computer Animation Languages

Animation functions include a graphics editor, a key frame generator and standard graphics routines.

The graphics editor allows designing and modifying object shapes, using spline surfaces, constructive solid geometry methods or other representation schemes.

Scene description includes the positioning of objects and light sources defining the photometric parameters and setting the camera parameters.

Action specification involves the layout of motion paths for the objects and camera.

Keyframe systems are specialized animation languages designed dimply to generate the in-betweens from the user specified keyframes.

Parameterized systems allow object motion characteristics to be specified as part of the object definitions. The adjustable parameters control such object characteristics as degrees of freedom motion limitations and allowable shape changes.

Scripting systems allow object specifications and animation sequences to be defined with a user input script. From the script, a library of various objects and motions can be constructed.

Keyframe Systems

Each set of in-betweens are generated from the specification of two keyframes.

For complex scenes, we can separate the frames into individual components or objects called cells, an acronym from cartoon animation.

Morphing

Transformation of object shapes from one form to another is called Morphing.