

## Animation

Animation is a method in which figures are manipulated to appear as moving image. In traditional animation, images are drawn or painted by hand on transparent celluloid sheets to be photographed and exhibited on film. Today, most animations are made with computer-generated imagery (CGI).

## cel Animation

cel Animation is the art of creating 2D animation by hand on sheets of transparent plastic called "cells".

24 frames per second therefore a minute may require as many as 1990 separate frames.

cel animation is based on changes that occur from one frame to the next.

cel stands for celluloid which is a clear sheet with images drawn on them.

The celluloid images are placed on a background that is usually stationary.

## 3-D Animation

3-D Animation involves three steps:

- (i) modeling
- (ii) animation
- (iii) rendering.

Modeling: The process of creating object and scenes.

Animation: The process of defining the object's motion.

Rendering: Progressively, as the scene starts to become more detailed and precise, we get the final result.

## Animation Techniques

- ⇒ As is evident from the history, animators have used and invented a variety of different animation techniques.
- Traditionally most of the animation was done by hand.
- ⇒ All the frames in an animation had to be drawn by hand. Since each second of animation requires 24 frames, the amount of work required to create even the shortest of movies, can be tremendous.

### Key Frames:

In this technique a storyboard is laid out and then the artists draw the major frames of the animation.

These major frames are in which a lot of changes take place. They are the key points of animation.

## Rotoscoping:

- \* Rotoscoping is a technique where images are copied from a moving video into an animation.
- \* The animator draws the motion and shape of the object by referring to the video as opposed to imagining in his head.
- \* The disadvantage is that one will have to hunt for the exact video that one wants to animate.

## Motion capture:

Another technique is motion capture, in which, magnetic or vision-based sensors record the action of a human or animal object in three dimensions.

A computer then uses these data to animate the object.

This technology has enabled a number of famous

Athletes to supply the actions for characters in sports video games.

### Simulation:

Unlike key framing and motion picture, simulation uses the laws of physics to generate motion of figures and other objects. Virtual humans are usually represented as a collection of rigid body parts.

## Fundamental principles of traditional animation techniques

It all started after the 30s when Walt Disney noticed that the level of animation was inadequate for some new story lines. Classes for his animators were set up under the instruction of Don Graham.

Before the classes, the animators were made with little or no reference to nature. Out of these classes grew a new way to drawing moving human figures and animals, where the analysis of real action became important to the development of animation. After a while, each technique was named the fundamental principle of animation.

The principles are :

### Timing:

Timing is the essence of animation. The speed at which something moves gives a sense of what the

object is, the width of an object, and why it is moving.

### Ease In and Out:

Ease in and out to do with gradually causing an object to accelerate, or come to rest, from a pose.

An object or limb may slow down as it approaches a pose (ease in) or gradually start to move from rest (ease out).

### Arcs:

In the real world almost all action moves in an arc. When creating animation one should try to have motion follow curved paths rather than linear ones.

## Anticipation:

Action in animation usually occurs in three sections. The setup for the motion, the actual action and then flow-through of the action. The first part is known as anticipation. In some cases anticipation is needed physically.

## Exaggeration:

Exaggeration is used to accent an action. It should be used in measured and balanced manner, not arbitrarily.

## Squash and Stretch:

Squash and stretch is a way of deforming an object such that it shows how rigid the object is.

An important note about squash and stretch is that one must know how an object deforms. It should still appear to retain its volume.

## Secondary action:

Secondary action creates interest and realism in animation. It should be staged such that it can be noticed but still not overpower the main action.

## Follow Through and overlapping actions:

Follow through is the same as anticipation, only at the end of an action.

## Straight Ahead Action and Pose-to-Pose Action:

There are 2 basic methods to creating animation.

Straight ahead animation is one where the animator draws the first frame of the animation, then draws the second, and so on until the sequence is complete.

### Staging:

Staging is presenting an action or item so that it is easily understood. An action is staged so that it is understood. A personality is staged so that it is recognizable.

### Appeal:

Appeal means anything that a person likes to see. Appeal can be gained by correctly utilizing other principles such as exaggeration in designs, avoiding symmetry, using overlapping action.