

BA(prog)III yr
Animation by Computer

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- Various software and techniques are used to animate visual images in many ways.
- The simplest animations occur in two-dimensional (2-D) space; more complicated animations occur in an intermediate “2½-D” space (where shadowing, highlights, and forced perspective provide an illusion of depth, the third dimension).
- The most realistic animations occur in three-dimensional (3-D) space.
- In 2-D space, the visual changes that bring an image alive occur on the flat Cartesian x and y axes of the screen
- A blinking word, a color-cycling logo (where the colors of an image are rapidly altered according to a formula), a cel animation , or a button or tab that changes state on mouse rollover to let a user know it is active are all examples of **2-D animations**.
- These are simple and static, not changing their position on the screen.
- **Path animation** in 2-D space increases the complexity of an animation and provides motion, changing the location of an image along a predetermined path (position) during a specified amount of time (speed).
- Authoring and presentation software such as Flash or PowerPoint provide user-friendly tools to computer position changes and redraw an image in a new location, allowing you to generate a bouncing ball or slide a corporate mascot onto the screen.
- Combining changes in an image with changes in its position allows you to “walk” onto the stage.
- Changing its size from small to large as it walks onstage will give you a 3-D perception of distance.

2½-D animation

- In **2½-D animation**, an illusion of depth (the z axis) is added to an image through shadowing and highlighting, but the image itself still rests on the flat x and y axes in two dimensions.
- Embossing, shadowing, beveling, and highlighting provide a sense of depth by raising an image or cutting it into a background.

3-D animation

- In **3-D animation**, software creates a virtual realm in three dimensions, and changes (motion) are calculated along all three axes (x, y, and z).
- They allow an image or object that itself is created with a front, back, sides, top, and bottom to move toward or away from the viewer, or, in this virtual space of light sources and points of view, allowing the viewer to wander around and get a look at all the object's parts from all angles.
- Such animations are typically rendered frame by frame by high-end 3-D animation programs such as NewTek's Lightwave or AutoDesk's Maya.
- Today, computers have taken the handwork out of the animation and rendering process, and commercial films such as *Shrek*, *Coraline*, *Toy Story*, and *Avatar* have utilized the power of computers.

Animation Techniques

When you create an animation, organize its execution into a series of logical steps as hereunder:

1. First, gather up in your mind all the activities you wish to provide in the animation. If it is complicated, you may wish to create a written script with a list of activities and required objects
2. Then create a storyboard to visualize the animation. Choose the animation tool best suited for the job.
3. Then build and tweak your sequences. This may include creating objects, planning their movements, texturing their surfaces, adding lights, experimenting with lighting effects, and positioning the camera or point of view. Allow plenty of time for this phase when you are experimenting and testing.
4. Finally, post-process your animation, doing any special renderings and adding sound effects.

Cel Animation

- The animation techniques made famous by Disney use a series of progressively different graphics or cels on each frame of movie film (which plays at 24 frames per second).
- A minute of animation may thus require as many as 1,440 separate frames, and each frame may be composed of many layers of cels.
- The term **cel** derives from the clear celluloid sheets that were used for drawing each frame, which have been replaced today by layers of digital imagery. Cels of famous animated cartoons have become sought-after, suitable-for-framing collector's items.

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