

Computer Animation

What is animation?

According to Webster's Unabridged Dictionary, animation is the state of being lively, brisk, vigorous quality. With one click into the Internet domain, one is drawn to blinking text, waving banners ... a lively quality indeed. Such displays of animation are a result of the technique made famous by Walt Disney in the 1930s. A series of progressively different graphics on each frame of movie film would play 24 frames per second. An inanimate drawing of a mouse became a much-loved personality once animated. The terminology incorporating animation thus evolved from Disney's efforts.

What is Cel Animation?

The term *cel* derives from the clear celluloid sheets that were used for drawing each frame. The series of frames in between the keyframes (first and last frame of action) are drawn in a process called tweening. *Tweening* an action requires calculating the number of frames between keyframes and the path the action takes, and then actually sketching onto a cel with pencil the series of progressively different outlines. Cel animation is the traditional method of eight overlapping stages:

- Storyboard (scripting)
- Soundtrack
- Exposure sheet (giant spreadsheet to log sound and direction for animation)
- Background painting
- Drawing
- Pencil testing

- Inking and coloring
- Compositing

Wagstaff (p. 147, 1999) recommends for low-end cel animation WebPainter, a simple cel animation tool for the Macintosh that provides capable onionskinning and painting tools. It can quickly add and delete frames in a window and quickly switch onionskinning to show previous or subsequent frames. The other cel animation paint tool for Windows called ProMotion is not as simple to use according to Wagstaff.

What is keyframe animation?

Keyframe animation programs eliminate many of the traditional steps. The keyframe tools offer automatic inbetweening – that is, you set up the key frames, and the program calculates and generates the inbetween frames for you. These programs are primarily used to animate the elements of graphic design: type, photography, and individual pieces of hand-drawn art. Many of these programs also work well with frames of video and film. Macromedia Director and Macromedia Flash animate one frame at a time when they work with hand-drawn cels, or they generate inbetween frames for objects moved from point to point or rotated. (p.119)

What is computer animation?

Computer animation follows the same format by filming a sequence of painted cels then using layers, keyframes, and tweening techniques. Layers provide the capability to place one image on top of another and to allow all or part of the underlying image show through. This capability allows you to maintain registration between multiple frames of animation and to see how various images in an animation go together.

Registration is a crucial concept in animation. Registration points let you know whether

your layers are aligned. When you work with Adobe Illustrator, Macromedia Freehand, or another program that support layers, you can copy and paste the registration point into every layer in the drawing so that the points exactly overlap. (Vaughn p.156, 1998) On the computer, paint is most often filled or drawn with tools using features such as gradients and anti-aliasing (soft gray edges that make lines appear smooth). The word *inks*, in computer animation terminology, usually means special methods for computing RGB (red, green, blue) pixel values, providing edge detection, and layering so that images can blend or otherwise mix their colors to produce special transparencies, inversions, and effects. (p. 325)

Animation using Macromedia Dreamweaver

Dreamweaver is a Web-page design tool that allows users to animate elements of pages with graphical interface. You set up a timeline reminiscent of the timelines in Director and Flash. You can quickly set up animation of an object by setting values such as scale and position on the timeline as keyframes. Here is how you create a simple DHTML (combination of HTML and Java scripting) animation in Dreamweaver:

1. Open a new document
2. Place an image on the page by clicking the Insert Image button and choosing a file in the file dialog.
3. Choose Insert/Layer to create a new layer in the document. This layer appears as a bounding box with a marker and a position handle. If you click with of these objects, control handles will appear around the layer, indicating that it is selected.
4. Drag the image into the layer box to add it to the layer.
5. Select the layer in the Timeline window.

6. Choose Modify/Add Object to Timeline. This command inserts a control track for the layer into the timeline.
7. Drag the final keyframe of the layer's control track left or right to adjust the duration of the animation.
8. Select the final keyframe of the layer's control track, grab the position handle of the layer, and move the layer across the page window. This step sets the position of the layer at the selected frame in the timeline. A line indicates the animation path.
9. Select a point on the timeline halfway between the first and last keyframes; then move the layer again to set its position at the new point in time. This step creates a third keyframe, and the animation path changes to curve connecting the three key positions.
10. Save the page in HTML format.
11. Open the page in your browser, which should be Netscape or Internet Explorer.
(Wagstaff p.444-450)

Animation using Director

In Director, you can create animations that are highly interactive and that take advantage of advanced programmatic controls created with Director's scripting language, call Lingo. To build a project – called a movie—in Director, you begin by importing or painting cells of animation into a *cast*. Then you place the cast members on a *stage* as *sprites*, which you can animate by *tweening* or by cycling through consecutive cast members. You control sprites with a spreadsheet-like timeline called the *score*. Finally, you give sprites *behaviors* by using the Lingo language to attach programs called *scripts*.

Director can also be used for traditional cel animation, which may not be as compact as tweened animation but can be much more graphically interesting and pleasing. There is a command, Cast to Time, that makes a series of cast members animate over time. Select all the cels in sequence then choose the Modify/Cast to Time command. The cels are automatically compiled into a single sprite on stage. This sprite can be animated using automatic tweening. This sprite can be animated as many times as you like.

On the score, each layer of animation is given its own track, and as the animation plays, all the tracks with any action play along. When one frame of the script track or one of the sprites has a behavior attached at a particular frame, the behavior executes when the needle arrives at that point in time. Each column of the score represents a frame of action; each row is an actor, script or event.

Shockwave animation

Shockwave is Macromedia's collection of compressors and run-time player plugins for delivering to Director, Flash, and Authorware projects over the Web. To create a Shockwave animation in Director one must first install the Shockwave plug-in in your browser. Follow the following process:

1. Launch Director
2. Choose File/New/Cast to open the New Cast dialog, and name the cast example.

3. Click the first frame in the cast and choose File/Import to open standard file dialog.
4. Navigate to the example folder and choose Add All.
5. Click the import button to add all the frames to the cast. Notice that Director automatically imports the frames in proper order if the files are numbered.
6. In the Cast window, Command+click all the cast members that make up the cels of the animation (right click in Windows) to select them all.
7. Choose Modify/Cast to Time. The cast members are placed on stage in a sequence as a sprite. The cast members also appear on the first timeline in the Score with a duration equal to the number of frames in the new sprite.
8. Click frame 0 in the score to move the time pointer to that frame; then select the sprite on the stage and drag it to the left side of the screen.
9. In the Score, click the last keyframe for the sprite (represented by a small vertical bar) and then drag the sprite to the right side of the stage. This step changes the position of the sprite at that keyframe so that the sprite animates across the screen.
10. Click Play in the Control Panel to preview the animation.
11. To adjust the timing for the animation, drag the last keyframe for the sprite from frame 10 to frame 60 in the Score. This step stretches the animation to take more time.
12. To add a behavior to the sprite, choose Xtras/Behaviors to open the cast of preset behaviors. You can drag and drop behaviors onto the objects to apply them. For this example, choose Frame: Hold on Current and drag to frame 60 in the script track of the Score.

13. Play the animation again to see the effect of this behavior. The timeline and the animation should play smoothly all the way to frame 60 and then stop.
14. Add a user input behavior to the sprite. Drag the behavior Frame: Go to /Play Number to the sprite's timeline in the Score. A small dialog box opens, allowing you to specify parameters to the behavior. Enter 1 in the Frame box, choose Initializing Event: MouseUp and Play Mode: Go to, and click OK to accept the changes. Now, whenever the movie is playing or paused, clicking the sprite causes the movie to jump to frame 1 and begin playing again.
15. To make the movie play with sound when the viewer clicks the sprite, drag the behavior Sound: Play Member onto the Score. In the behavior's dialog box, choose the cast-member sound file to play.
16. Play the movie. Notice that when the movie pauses at the last frame, you can click the sprite, and the movie jumps to frame 1 and begins playing again. Any time you click the sprite, the sound plays also.
17. Choose File/Save AS Shockwave Movie to save the movie in Shockwave format.
18. Drag the Shockwave movie to your browser's window to preview it. The movie should start playing. (p.379-383)

Animation using the computer is like a front door to Web sites. Simple animation is easy to accomplish and can add a lot of visual interest. Listed below are products to include in your animation library:

- Pacework's Object Dancer: specialize in animating text.

- Adobe After Effects: powerful text on path plug-in that works with all the other features of the professional animation tool.
- QuickTime Virtual Reality: images you can “walk” through using your mouse.
- 3D Images: images created in three dimensions that can be rotated and viewed from any angle.
- Shockwave: combines animation, sound, and interactivity.
- Java: programming that creates applications that can run from within the web site.
- JavaScript: scripts, or small programming sequences, that can make certain actions take place.
- ActiveX: programming that creates and allows interactivity within the web site.
- Database interaction: the browser creates web pages “on the fly”, calling upon changing information in a database and combining that information with designated graphics to create a page that reflects the latest possible information.
- GIF89a: with Version 2.0 of Netscape Navigator, Netscape implemented an animation feature of the final 1989 revision “a” of the GIF (Graphics Interchange Format) specification. It is possible to make simple animations by putting multiple images or frames into a single GIF89a file and display them with programmable delays (in 100ths of a second) between them. When you use the tag to embed a GIF89a multiframe image, Netscape Navigator will download the file and store it in the cache folder of your local hard disk. Once fully downloaded, the

image will play each frame quickly and smoothly. Limit animated GIFs to small images, and use a more capable plug-in for animations over larger areas.

The variety presents a challenge to the animator. The golden rule is to keep animation simple and don't overuse it. The effect is to be lively not repetitive.

References:

Hubbard, J. & O'Connell, K, Computer animation, Microsoft® Encarta® Online Encyclopedia 2000

Vaughn, T. (1998) Multimedia: Making it work. Berkely, CA: McGraw Hill.

Wagstaff, S. (1999) Animation on the web. Berkeley, CA: Peachpit Press.

Animation sites:

<http://www.visualcities.com>.

CNET : Search results for **computer animation**

Found **30** Displaying: **16-30**

[Ray Dream Studio 5 to Offer Powerful Design, Animation Capabilities](#) [PC World]

July 5, 1997 – Fractal Design today announced a new version of Ray Dream Studio Version 5, its 3-D design and animation software for artists. The new release promises to bring ...

[Ray Dream Studio 5 to Offer Powerful Design, Animation Capabilities](#) [IDG.net]

Fractal Design today announced a new version of Ray Dream Studio Version 5, its 3-D design and animation software for artists. The new release promises to bring ...

[Lines drawn over Web animation](#) [IDG.net]

IDG, October 19, 1998 – GifBuilder may be shareware, but it's still the most popular Web animation tool for the Mac.

Macworld reports that three software heavyweights -- Adobe, Extensis and Macromedia -- are working to ...

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[Computer Animation Atlanta](#)

1. [Computer Graphics and Animation Home](#) . This site is still an ongoing process, and is being worked on almost constantly. The purpose of these pages is to teach people about computer graphics and animation. These pages

<http://www.bergen.org/AAST/ComputerAnimation/>

2. [Welcome to Pixar's Home Page!](#) Feel free to surf through our company information, our projects, our products and our job opportunities. Enjoy your visit! TOY STORY 2 WINS GOLDEN GLOBE FOR BEST MOTION PICTURE -

<http://www.pixar.com/>

3. [Kevin's Animated GIFs Page! Last updated 11.08.98](#) A HUGE collection of Animated GIFs from all over the net

<http://www.crosswinds.net/los-angeles/~kevin/gifs.html>

4. [A Brief History of Motion Capture for Computer Character Animation](#) The use of motion capture for computer character animation is relatively new, having begun in the late 1970's, and only now beginning to become widespread. Motion capture is the

http://www.css.tayloru.edu/instrmat/graphics/hygraph/animation/motion_capture/history1.htm

5. [JORDI MORAGUES - Computer animation](#) Excerpts and information about my computer animation works, plus useful resources for the beginner.

<http://www.iaa.upf.es/~jordi>

6. [An-amaze-tion Company - Computer Animation for the Industry](#) We are a 3d computer animation and digital audio / video production house producing only the finest output for the broadcast, film, forensic, architectural, environmental, and

<http://www.an-amaze-tion.com/>

7. [Legal Animation, Forensic Animation, Computer Animation, Scientific Animation](#), Sigma Animation: An animation company specializing in technically accurate, high-quality animations and 3D analyses for the legal industry.

<http://www.sigma-animation.com>

8. [animation intro](#) Hi there, and welcome to the ANI TOURS! I'm Toots, and I'll be your guide for the rest of your visit. SO YOU WANT TO LEARN ABOUT ANIMATION? What? Why, animation of course. The

http://www.art.uiuc.edu/local/anle/ANIMATION/animation_intro.html

9. [Spicy Cricket Animation--Hello and Welcome!](#) 3D Computer Character Animation for Film, TV, Multimedia and Games.

<http://www.spicycricket.com/hello.html>

10. [Pineapplehead Broadcast Solutions](#) Pineapplehead is a sports broadcasting, computer animation and web development company. Our flagship product is Green Reader VR, a golf course visualisation tool used by channel 7

<http://www.pineapplehead.com.au/>

1. Computer Graphics and Animation Home . This site is still an ongoing process,
and is being worked on almost constantly. The purpose of these pages is to teach
people about computer graphics and animation. These pages

<http://www.bergen.org/AAST/ComputerAnimation/>

2. Job Listing for a Graphics Artist November 28, 1999 34,900 Jobs Online - HOME -
FOR EMPLOYERS LOCAL- Select a City ---- Atlanta Baltimore Boston Charlotte
Chicago Cleveland Columbus Dallas Dayton Denver Detroit

<http://www.careerweb.com/jobsearch/joblist.cfm?JobID=387061&Keyword=animation%20computer%20graphics>

3. the 1st Internet Gallery of GIF Animation If you have come from another site,
please notify them that the gallery has relocated to

"<http://members.aol.com/royalef1/galframe.htm>" for more space. the Gallery has R e-

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<http://members.aol.com/royalef/galframe.htm>

4. Computer Graphics International Conference in Central Europe on and
Visualization Electronic Visualization Laboratory Army Research Labs - Scientific
Visualization AHPCRC Graphics Software AirForce

<http://mambo.ucsc.edu/psl/cg.html>

5. QB's Computer Animation & Graphics QB's Computer Animation & Graphics.

Original Artist prepared Animations/Stills 3D Models for all media types - video, print,
games.

<http://www.halcyon.com/jpoff/>

6. Make Your Own WWW Site - Web Graphics www.Tparents.org - Rev. Sun Myung
Moon, Founder - Gary Fleisher, Webmaster Your www Page (Graphics) Installing

Tparents.org Zip files on your web page , How to copy graphics to

<http://www.tparents.org/Lib-www.htm>

7. Scott's Anime and Computer Graphics Page Scott's Anime Page Sites I sponser

Sasami's Kitchen Washuu's Subspace Laboratory Sailor Moon's Meeting Place

Anime Survey Please Fill Out For Me. Welcome to My page on

<http://members.tripod.com/~Kedri/>

8. Animated GIFs by Lawrence Goetz Free animated GIFs for your web page.

<http://pages.prodigy.com/VDJW65A/gifs.htm>

9. Syracuse University AMS-Computer Graphics This Web Server houses faculty and

student projects and facilitates the collaboration between artists and others

individuals located across the Internet. This server is always

<http://ziris.syr.edu/home.html>

10. Media Link's Free Graphics! All the freebie web graphics here are free for use on

personal web sites only (not to be offered for use or download from your site

however). If you would like to use any of them

<http://www.ernet.com/cunning1/tiles.html>

***This paper is written by Barbara Harper for the course EDC385G Multimedia Authoring at the University of Texas at Austin.**