Digital Video-Editing Programs
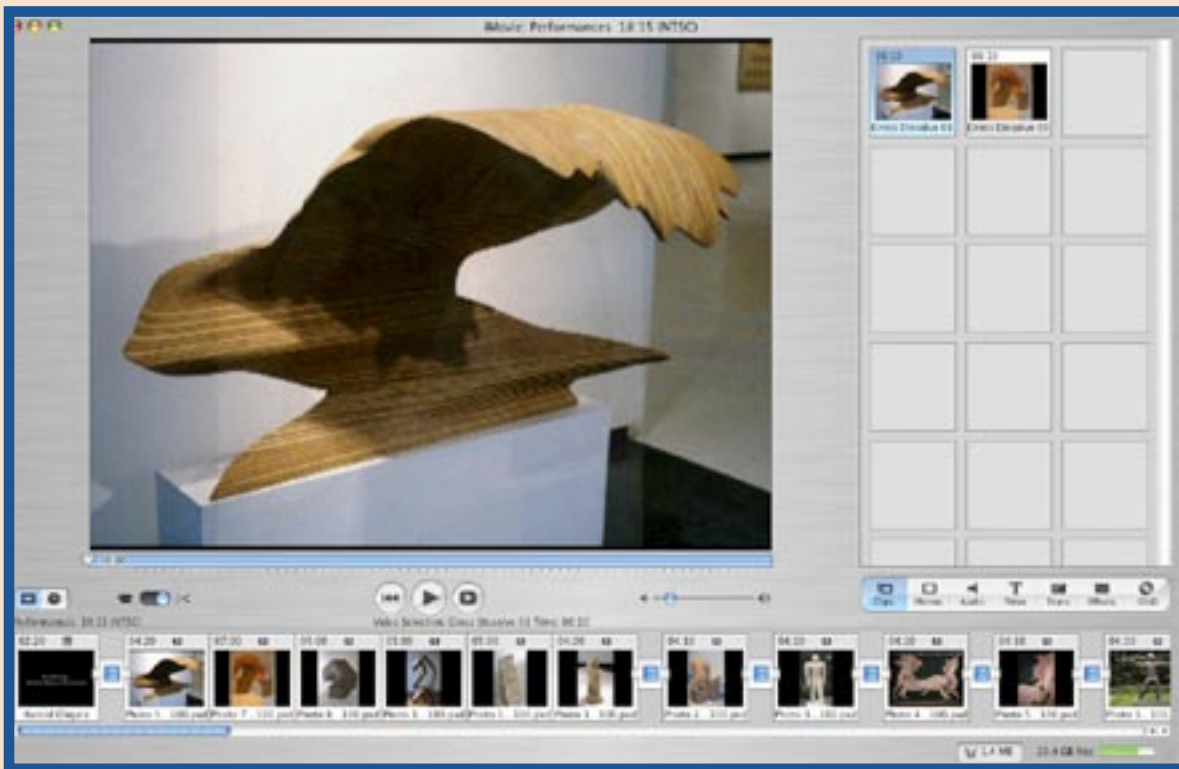

Digital video-editing software gives you ready access to all your digital video clips. Courtesy Harold Olejarz.

What Can They Do?

- enable you to produce broadcast-quality video on classroom computers that can be exported to digital videotape, transferred to DVD or VHS tape, or posted on the Web

- enable you to import digitized still images from your computer's hard drive, from a CD, or downloaded from the Web

- enable you to add titles, voice-overs, music, sound effects, transitions (see "Glossary," below), and special effects to video projects to create a documentary or video slide show

Glossary

importing video: to transfer video from your DV camcorder to your computer.

clip: a segment of video footage

frame: a still image in a video clip. The US standard (known as NTSC) for video is 29.97 frames per second.

crop markers: used to indicate where to cut a clip.

transitions: timed spaces placed between clips, used to create effects such as fading from one clip to the next or fading to black.

nonlinear editing: With digital video, unlike VHS tape, you have ready access to all of your clips without having to search through tape.

Project Ideas

- Create a commercial, an artist interview, a short movie, or a video report on an artist(s), artwork(s), or art movement(s)

- dramatize a poem or a scene from a play; interpret music or songs

- demonstrate an art technique

3-D Graphics Programs

What Can They Do?

- enable you to create three-dimensional landscapes, characters, or objects for computer games, animations, Web-based applications, and printed documents
- allow you to better understand the rules of perspective by exploring the creation of "illusionistic" space
- allow you to create interactive "stage sets" where viewers can move through the environment and interact with the objects in the environment
- allow architects and designers to create virtual environments for architectural and interior design projects

The Basics

1. The work area in a 3-D program is an illusionistic, three-dimensional space with **planes** representing height, width, and depth.
2. 3-D software may include both graphics and animation options.
3. In 3-D programs, objects are placed in **scenes** where you can arrange the objects and control how the object and scene are lit and the point of view the viewer has of the object and scene.
4. Modeling is the first step in creating a 3-D graphic or animation. In the **modeling** stage you may work with a wire-frame model of an object and edit the surface or tex-

An image from a short moving clip created with 3-D graphics and animation software. Courtesy Dave Parmenter.

ture of that object.

Texture Mapping

This method of adding realism to 3-D graphics involves adding an image of a surface texture to a simpler wire-frame shape.

Rendering

The last step in creating an illusionistic 3-D graphic or animation, **rendering** is the process of making a 3-D scene look realistic by applying textures, colors, and lighting effects. Rendering a complex 3-D graphic may take hours. The more powerful your computer, the faster it can render a 3-D scene.
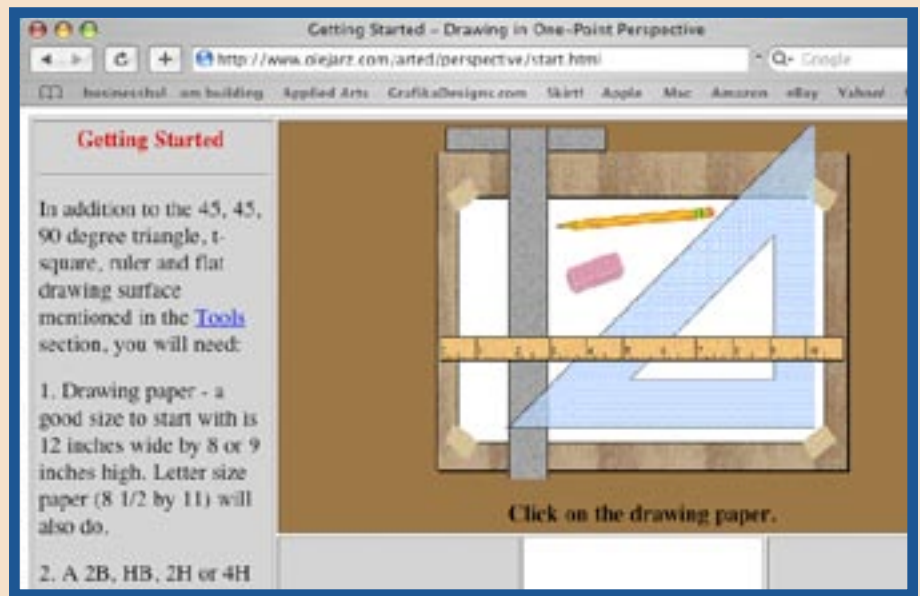
Multimedia Programs

What Can They Do?

- enable you to create interactive programs using video, animations, text, sound, and images. Your interactive programs may be saved as interactive CDs or posted on the Web.

- enable you to create narrated interactive student or class slide shows using still images or video clips

- enable you to create interactive virtual tours or interactive presentations

The Basics

1. Creating a multimedia program project requires lots of **planning**. It is important to gather all of the elements, images, audio, video, and graphics that will be used in the multimedia project. The elements used in a multimedia project are called **objects** or **cast members**.

2. Some multimedia programs work on both PCs and Macs. Other multimedia programs are specific to either a Mac or Windows operating system.

3. Multimedia programs enable users to create what some programs call **buttons**. Buttons are used to navigate from one part of the multimedia project to another. When a button is clicked on or passed over, something is programmed to occur.

A screen from an interactive program created with multimedia software. Courtesy Harold Olejarz.

4. Parts of graphics or other screen locations may also be programmed to work like a button: when you use your mouse to click on or move over these locations, something is programmed to occur.

Screen Coordinates

Measured in pixels on horizontal and vertical axes, **screen coordinates** are used to set the location of text or graphics.

Timelines

These are used to establish when events in the multimedia program begin and end.

Project Properties

Most multimedia programs have an **inspector** feature. An inspector gives information about a graphic, video or text element used in a multimedia project. This information is called the properties of the object.

The Workspace

Depending on which multimedia application you are using, terms such as **screen**, **stage**, or **slide** may be used to refer to the workspace of the multimedia program.

Image-Editing Programs

What Can They Do?

- allow you to prepare images and text for print or for posting on the Web. (Examples include: greeting cards, postcards, and posters, or book, magazine, and CD covers.)

- enable you to combine several photos to create a collage, or photomontage

- help you correct and edit photos by providing the tools to remove red-eye, adjust color and contrast, fix poor lighting, and sharpen, rotate, and crop images

- enable you to manipulate photos with paint tools and filters

The Basics

1. Image-editing programs include many of the tools used in paint programs.

2. Several tools common to image-editing programs simulate traditional darkroom activities. These include the **Burn**, **Dodge**, and **Crop** tools.

3. Image-editing software files, like paint software files, are bitmap images, also known as **raster images**. This means that the photograph or digital bitmap image is made up of tiny dots (pixels). If you increase the size of a bitmap image, the resolution of the image may suffer, causing the image to appear blurry, or pixelated.

Image-editing programs such as Photoshop provide tools for manipulating digital photography and other images.

Layers and Filters

Most image-editing programs support **layers**. Layers are like sheets of clear glass on top of a background image. If you create a new layer above a photo layer, you can draw, paint, and erase on the new layer without altering the photo on the background layer. Image-editing programs also include **filters**. Filters are based on a traditional photo filter, which is placed in front of a camera lens. You can use a filter in an image-editing program to make subtle or radical changes in a digital image.

Bitmap File Formats

Files created with image-editing programs include **JPG**, **GIF**, **TIF**, **PNG**, **PICT**, and **PSD**. Photographs are usually saved as JPG images, the GIF format is used for digital video images to be used as Web graphics, and the TIF format is used for print. Both JPG and GIF are compressed file formats, while TIF files are not compressed. Compressed file formats reduce the size of an image but may lead to some data loss.

Animation Programs

What Can They Do?

- create frame animations that can be burned to a CD, posted on the Internet, or exported to video with an animation program

- enable students to create professional-looking animated 3-D text and graphics

- generate frames in an animation and save an artist the time needed to draw or construct all of the frames needed to create a computer animation

The Basics

1. A **key frame** is an image in an animation that is drawn or constructed by an artist. Think of the individual drawings in a comic strip that are usually enclosed by a bordering line. (See "Motion Path," below, for more on key frames.)

2. Like movies recorded on film, animation software creates the illusion of **movement**, with one still image, or frame, replaced by another. If the frames are played at a fast enough rate, the animation looks like natural movement. Think of a flipbook.

3. Animation software has had a huge impact on the way animated movies are made. Conventional cartoon animation was shown at 12 **FPS** (frames per second), so that fewer drawings were needed to create a cartoon. Movies are shown at a rate of 24 FPS. In order for computer animations to be convincing, they should be played at a rate of 24 FPS.

An image from an online role-playing game created with an animation program. Courtesy Turbine Entertainment Software.

4. Photos, videos, music, and other audio may be imported into animation projects.

Timelines

Animation programs use **timelines** to help animators plan and control the content, sequence, and timing within an animation.

Tweening

This is the process an animation program uses to generate the frames between key frames in an animation. This saves animators the task of having to draw 24 frames for every second of an animation.

Motion Path

Animations may also be created by describing a **motion path**, telling the computer where you want an object to move to over a designated period of time. To create an animation, an artist may draw or construct one key frame showing an animation at a start point and another key frame showing the animation at an end point. Animation software can then be used to generate the motion path, or series of frames, in between the two key frames.

DAVIS

Digital Video Cameras

What Can They Do?

- record and store video in a digital format on a mini DV tape or DVD-R
- make it possible to create broadcast-quality videos
- play video on a TV
- transfer video from the camera to a computer
- capture video from a computer
- record video from an analog source such as a VHS camcorder or VCR

The Basics

1. Mini DV is the most popular type of consumer digital video format. MiniDV tapes are the most popular and economical way to record your video projects.

2. Mini DV camcorders are very small, which makes them easy to carry and hold. They are, however, often quite difficult to keep steady. Though many cameras come with an **image stabilizing** feature, it is best to use a tripod whenever you can.

3. A **CCD**—or charge-coupled device—is a light-sensitive image sensor that the camera uses to capture an image. Most consumer video cameras have one CCD. More expensive models may have three CCDs, which help to capture a better picture.

4. DV camcorders can record still images but the resolution of the images is not as high as that of still digital cameras.

A tripod is the best way to steady a digital video camera.

Using Zoom

Optical zoom lets you zoom in on a scene by using the focal length of a lens, as with a traditional camera. **Digital zoom** lets you zoom in on a scene by magnifying pixels. Because it causes the image to be pixelated, or fuzzy, digital zoom will degrade the quality of your video.

Special Effects

Most DV camcorders have built-in special effects that you can use while taping. Unlike special effects applied with video-editing software, **in-camera special effects** cannot be undone. Thus, if you tape a scene with an in-camera special effect, you will not be able to undo the effect.

NTSC Video Systems

NTSC stands for National Television Standards Committee and refers to the **broadcasting standard format** used in North America and some other countries such as Japan. DVD discs are not universally playable. PAL, or phase alternating line, is the Western European video standard. To play a DVD disc recorded in one format on a player that uses the other format requires a player with a built-in converter.

Digital Cameras

What Can They Do?

- enable you to make photographs without film

- enable you to take pictures that can be viewed instantly, or transferred to a computer and manipulated with image-processing software to create digital art

- enable you to take pictures of artworks for portfolios, presentations, or to use in other digital media such as Web pages

The Basics

1. Digital cameras capture images in varying **megapixel sizes**. (Pixels are the tiny dots that make up the images you see on a computer screen or television. A megapixel equals one million pixels.) The more megapixels your camera has, the better **resolution**, or clarity, your images and prints will show. Generally, a 3 megapixel camera will give you a high-quality 5" x 7" print.

2. Digital cameras store pictures on **memory cards**. The larger the card size, the more pictures it will hold. If the camera you are using is 5 or more megapixels, you will be able to make larger-size prints but your storage (memory) needs will be greater, since each picture's file size will be larger.

3. Digital cameras require lots of power. If your digital camera uses AA batteries, get rechargeable batteries. If your camera uses a special battery, get an extra. Having no **battery power** in a digital camera is like running out of film in a regular, or analog, camera.

Digital cameras let you see the picture right after you take it.

Optical vs. Digital Zoom

Optical zoom uses the camera's lens to zoom in on a subject. The greater the optical zoom, the better the quality of your close-ups will be. **Digital zoom** magnifies pixels, making them larger, to create a close-up. With digital zoom, your close-ups will not be as sharp.

Transferring Images to Your Computer

Cameras usually come with software that allows you to **transfer images** from the camera to your computer. Check to see how the camera's software will work with your computer setup. Some computers come with software that automatically transfers images from your camera to your computer. Pictures may also be transferred to a computer with a card reader. The memory card is taken out of the camera and put into a card reader. The card reader is connected to a USB port on your computer. You may then simply drag your picture files into a folder on your computer.