

Web Imaging II

Creating w/Fireworks



Utah
Education Network

Staff Development



Web Imaging II

Welcome

Welcome to UtahLINK's Web Imaging II: Creating Images for the Web. This course explores the opportunities and challenges related to designing custom graphics for web site design. This course is not based on HTML (HyperText Markup Language), although the material is presented with the intention of using the images for web sites. Some discussion of HTML is included in the class and familiarity with the language is beneficial.

Creating images for use in web applications is substantially different than creating images for print or other mediums. However the basic principles of design, layout and color theory are relevant to creating good web graphics. This is a skills oriented course; some discussion of color theory and design is included. However, the majority of time is dedicated to using Macromedia Fireworks as a tool for accomplishing specific web imaging tasks. For learning this software tool we will use Macromedia's own tutorial, which we have included as the majority of this manual.

This tutorial allows you to learn the different capabilities of Fireworks by providing hands-on exercises. These exercises provide you with the same tasks that the instructor is demonstrating, allowing you to follow along closely with what is being taught.

As we are progressing through the tutorial you should be thinking of ways you could use Fireworks to build graphics for your web use.

A note on software

We have chosen to use and teach Macromedia's Fireworks as our web-imaging tool. This program is by no means the only software that creates web graphics. Most other web graphics programs work very much like Fireworks and the skills you learn in this course are easily transferred to other tools.



Images for the Web Types and Uses

Thoughts on Image Uses

Images make the web an exciting place to gather information and be entertained, at the same time they can make the web very annoying. There is probably nothing more frustrating than accessing a web site that takes forever to load because of poor image use. Add to poor imaging, a slow modem connection and some sites can become useless. As an image creator there are things you can do to keep your site exciting, interesting and functional.

Images are used for many different applications on the web. In general terms, images are used for three basic uses: Buttons, Illustrations and Backgrounds. Buttons can take a wide range of shapes and sizes. They are typically used a graphical alternative to text hyperlinks. Illustrations can vary from scanned photographs to charts and diagrams. As a rule these types of images are content oriented. Background images are typically decorative in nature and work in a supportive nature for the site. This section of the course reviews the basic concepts related to working with images in a web based environment.

Image Types Review

In the world of the web there are three standard file formats used for displaying images: JPEG (Joint Photographic Experts Group), GIF (Graphic Interchange Format) and PNG (Portable Network Graphics). Of the three GIF and JPEG are the most commonly used. PNG is new to the web and will likely replace the GIF file format in the coming years.

Knowing when to use which format and how the different file types treat your images will help you create high quality images that will display efficiently over the Internet.

Unlike the rest of the world, on the web, bigger is rarely better. Keep these concepts in mind as you create images for the web. Physical image size should cater to the lowest common denominator, 14" Macintosh display. 400 x 600 pixel should be the largest image size. Optimal file size is 10KB - 30 KB. The physical size of an image should not be so large that you need to scroll to see the entire image. Scrolling to view text is one thing but if you cannot see the entire graphic at once it is too large.

GIF -v JPEG

Speed, resolution, and file attributes are all points to consider when creating graphics for the web. There are several image file formats that can be used to create images, but only two are commonly used. GIF and JPEG are the formats predominantly used on the web. Both file types have merit; the question that must be answered is when to use GIF and when to use JPEG. The most common rule of thumb applied to file types is "GIF is for line art and JPEG is for photographic images," but this is just a starting point, many other factors come

into play. The best thing to do is learn about the different file formats and experiment until you find the best compromise between file size, color depth and resolution.

The Mantra – GIF is for line art, JPEG is for photography.

Gifs

GIF stands for Graphic Interchange Format. CompuServe developed this file format for sharing image files over the Internet. GIF is considered a lossless type of compression because it maintains image detail within the limits of the format. GIF is an 8-bit format or is limited to 256 colors. If you are creating images using a 32-bit or a "millions of colors" pallet you must loose over 16 million colors before GIF is lossless.

It is recommended for line art or graphical art because the compression system used favors regular patterns and limited color depth. The compression system looks for horizontal color repetition and reduces the file information down to - ...*row 10 pixels 12 - 134 are blue, row 10 pixels 135 - 140 are red, row 11 pixels 1 -12 are yellow, etc.* The stronger the horizontal emphasis and the fewer number of colors the smaller the file will compress.

GIF has a few extra features that make it particularly useful for the web.

Interlacing is an attribute that can be added to the file information. This will cause the file to load as a low-resolution image quickly, with additional information added to the image as the file loads. This will allow your viewer to see the basic information quickly

Transparent background is another option that is especially useful for use with logos. When you export the file you have the option of identifying a color in the image that will display transparent to reveal the information behind it. GIF files can also be animated to add motion to you your image while keeping the file size manageable.

JPEG

JPEG was developed by the Joint Photographic Experts Group in an effort to create a better format for compressing photographic information. JPEG is a 24-bit file format and has a greater capacity to display colors and detail. JPEG separates the image into two types of information, color and detail. JPEG compression looks for blocks of color and applies compression to the block of information. The JPEG format has various levels of compression, all of which are lossy, in other words once the information is compressed it cannot be completely retrieved. The files can be scaled between 10:1 and 100:1 compression. At 10:1 the loss is barely noticeable. At the most extreme level of compression JPEG files may still look presentable over the web.

A new development in the JPEG camp is *Progressive JPEG*. This is a new compression scheme available in the latest releases of imaging software (including Macromedia Fireworks). Progressive JPEG compresses the image in multiple stages, achieving better compression. Additionally the image decompresses on the screen giving the appearance of an interlaced GIF.

JPEG files transfer over the net quickly, however they are slower to load because they require "post-processing" or decompressing when they reach the browser.

Note: JPEG isn't recommended as a 'working' file format. Resaving of a file in the JPEG format will cause multiple levels of compression, lost detail cannot be recovered. TIFF, PCX, BMP, TARGA, EPS or program specific formats are best for 'working' images.

Note: High contrast images, like clipart images, are not good candidates for JPEG because the artifacts from the compression become highly visible. Images with lower contrast and higher texture, like photographs, do a better job of masking the artifacts created by compression.

Which one works best is mostly a matter of trial and error when you have an image that isn't strictly a photo or line art. For instance a three dimensionalized navigation bar may actually view better as a JPEG because of the better representation of shading. If the image size is small you will often be better off to use a GIF; the decompression time of a JPEG will take longer than the straight download of the GIF.

Converting Images

After discussing the differences between the two preferred image file formats the next question that must be addressed is what to do with the image that must go on your web page that isn't a GIF or JPEG. This is typically easy to accomplish with image editing programs using the **Save As** or **Image Export** options. Keep in mind that by converting to a different file format you are typically sacrificing some file information. It is advisable to keep the "master image" in the most useable file format possible, just in case you need to make changes to your file.

Looking Ahead

Two newer file formats are gaining popularity in the world of imaging. Portable Network Graphics (PNG pronounced *ping*) is a new standard image format for web presentation. Flash is becoming the de facto standard for vector based artwork.

PNG

PNG is likely to be the replacement for the GIF file format. PNG claims 25% better compression and use of a 32-bit color pallet. The interlace and transparent background attributes are retained but the ability to animate PNG files is lost. New features supported by the PNG format include Gamma correction and Alpha Channel support.

Gamma correction is a way of controlling the brightness values of the image. Often the Macintosh platform will display graphics differently than on a PC. If you have worked very hard to have a specific color scheme, the PNG format gives the graphic designer the ability to make sure the image will display exactly as intended.

Alpha Channel is an opacity control that will give graphic designers the ability to have progressive transparency in their graphics. Unlike the GIF format that has transparency

based on a color or colors selected as transparent. This will give designers the ability to have a cleaner look to graphics and greater control over layout.

Flash

Flash is a product developed by Macromedia. This is a vector-based format that is great for creating animation and still images. The current releases of Netscape and Internet Explorer come bundled with the Flash/Shockwave plug-ins. There are many benefits to working in the vector environment. File sizes can be reduced and images can be scaled in size without degrading the overall quality of the image. A demo version of Flash is available at the Macromedia web site (<http://www.macromedia.com/software/flash/>).

GIF	A good image type for “graphic art.” This format is best used with images that have a limited number of colors in the design and a strong horizontal design element. The GIF compression is lossless within a 256 color or 8bit environment.
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JPEG	Designed specifically for electronically displaying photographs. This format supports “True Color” and works best for images with strong texture and detail aspects or complex coloring. JPEG compression is lossy so it is important to keep an original copy of images in a different format. Images that have large fields of a single color will display artifacts of the compression. Consider one of the other formats if these artifacts are present.
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PNG	A high color (32 bit) alternative to the GIF format, designed mainly for “graphic art” images but not limited to the horizontal limitations of GIF. PNG also supports Alpha Channel and Gamma Correction for better control of the image display. PNG is also a good long-term storage format when left un-optimized.
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Images for the Web Size and Optimization

File Size Management

Image file size is controlled by three different variables; dimension, resolution and color depth. Each of these can be adjusted to help reach the target file size of 10 KB - 30 KB.

Dimension

This is the easiest of the three elements to control. Images for the web are measured in pixels. Typically the largest image you would want to display on a web page is 600 x 400 pixels. Using default settings an image of this size would be about 240 KB, many times larger than our target file size. First rule to consider in making an image is keep the dimensions small. One way to accomplish this goal is to crop the image to include only information that is pertinent. Fancy borders and excess image size cause files to be larger than needed.

Resolution

Resolution is a measure of how sharp an image is or the amount of detail included in the file. In computer terms this is described as pixels per inch. A pixel is a picture element or the smallest defined portion of an image. The web is based on 72-ppi resolution, print and photographic resolutions are much higher than this mark. Make sure that your image is presented at 'web resolution' (72 ppi) so that the file sizes can be kept to a minimum. Resolution greater than 72 ppi is wasted information.

Example 1: If a one-inch square image has a resolution of 600 ppi or a total of 360,000 pixels in the image. Color depth can vary from 8 bits to 32 bits. At 32-bit color depth the image is 1.44 MB, a little too big for the web.

Example 2: The same 1 inch square image has a resolution 72 ppi or a total of 5,184 pixels in the image. At 32-bit color depth the file is about 20.7 KB

Color Depth

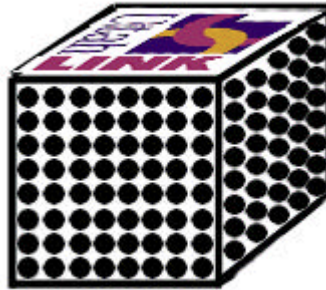
Within the 72-ppi environment, color depth has the largest impact on image file size. Color depth is measured in bits and is a rating of the number of colors available to describe a pixel in the displayed image. In short, images are measured in pixels. Each pixel is represented by a color. The number of possible colors a pixel may represent is described as the depth of the color pallet. The combination of file dimension, resolution and color depth adds up to the total file size of the raw image.

The following two images represent 4 bit and 8 bit images. The dimensions of the two images are identical with each dot representing a "bit" of information.

4 Bit



8 Bit



In mathematical terms a similar situation could be examined in the following terms.

Example 1: A 100 x 100-pixel image has 10,000 pixels of information. If the image has 32 bit color depth (16 million color choices) per pixel then the image size is approximately 32,000 bits or 4000 bytes (8 bits /byte) or about 4KB.

Example 2: The same 100 x 100-pixel image now has a color depth of 8 bits or 256 possible colors. The file size is now 8,000 bits or about 1 KB.

Limiting the number of colors used to describe an image is a way of reducing the file size of an image without sacrificing total image size. Color Depth and pallet customizing is a very involved process but once mastered can give you greater control over image size and file size.

Image Optimizing

Developing an efficient site should be one of the primary concerns of web designers. Images are by far the most common cause of poor web site performance. Images are often too large or improperly optimized, causing slow loading pages. Remember the following guidelines when making your images.

Optimize the Image

Regardless of the file type you select for presentation of your image there are ways you can optimize the file size. With PNG and GIF you can control the color depth or pallet size. This will give you great control over the file size while limiting the image to the essential information in the image. The JPEG file type has scaleable compression. Depending on the image a great deal of compression can be applied to an image without degrading the quality. Take the time to explore the options and work for the smallest file size possible while maintaining image quality.

Size Matters

Color depth and compression are two ways of managing file size. The easiest file control is simply making the image the best size for the job.

In short:

- Make the image the most efficient size for the job.
- Crop the image down to essential information.
- Let HTML (or CSS) create white space.

Image Types, not file types

Buttons

Square is not the only shape a button can take, in practice a button can be any shape or size within reason. The primary function of a button is to give a guest to your site a “device” to interact with. With this thought in mind one of most important design objectives when making a button is having its function clear. Secondary to the function of the button is the design element. If you are going to use graphical buttons for your site create one that adds to the overall look. Icons are commonly used on buttons in stead is plain text. When using icons be sure the intent of the button is clear. Test the design with many people before publishing your artistry.

A good button is often very clean in design unless you are adding three dimensional shading and lighting. Buttons and images in general that use complex lighting and shading effects are prime candidate for JPEG compression. If you keep the images basic then the GIF or PNG formats will be the best choice for your image.

Backgrounds

Background images should be just that, “background.” A good background image doesn’t distract from the foreground. These types of images should support your site not add to the information overload so common on the web. The texture and coloring should be low in contrast so that the content of your page will be easy to see. Background images are typically best stored as a JPEG because of the subtlety in color and texture. However, GIF may be just as likely a candidate so experiment to see what gives you the best results.

Illustrations

This family of images is difficult to define. They can take many forms, but content is the one thing that is consistent throughout. Illustrations need to be clear and simple in design especially if they contain specific information for the viewers of your site. This type of image is especially susceptible to the adage; “If it doesn’t add to the image *it is* taking away.”

Image Maps – putting it all together

Image Maps combine aspects of all of the previous categories. By default they fall in the illustration category. However, they deserve individual treatment because of their complex nature. An image map is a graphic that combines illustration with the functionality of buttons and the artistic nature of background imagery. The long-range goal of this class is to create a quality image map. This will require you to be able to develop good buttons, create effective

illustration and package it in a pleasing environment. In addition to the graphical challenges of creating an image map, HTML enters the picture to make the buttons within the image active.



Course Evaluation

Course Title

Instructor

Dates

Please give both a numerical rating and an explanation. On numerical items, 1 means poor, 2 means fair, 3 means average, 4 means good, and 5 means very strong.

Overall, how would you rate your course experience as compared to other inservice you have received? 1 2 3 4 5

Compared to other UEN Staff Development Training you've taken, how would you rate this course? 1 2 3 4 5

What was the **best part of this class**?

List three **ways this class could be improved**.

What should the course **spend more time on** or cover that it doesn't?

In terms of curriculum, what should the course **spend less time on**?

How would you rate the **clarity** of the curriculum? 1 2 3 4 5

How would you rate the **delivery** of instruction? 1 2 3 4 5

How would you rate the **knowledge of your instructor/s**? 1 2 3 4 5

How would you rate the **accessibility of instructors and level of personal attention**? 1
2 3 4 5

How would you rate the **manual quality**? 1 2 3 4 5

How would you rate the **pace of instruction**? Too Fast Good Too Slow

What will be your biggest **obstacles to implementation** of what you learned?



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