

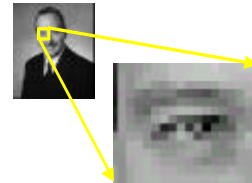
Images

Dr. Charles Severance

(portions adapted from Richard Wiggins' materials)

Images in Computers

- To store images in computers they are broken into Pixels - Picture Elements
- The "size" of a pixel is determined when the image is created
- An example of pixel size would be 75 "dots-per-inch"



Red, Green, and Blue

- By varying levels of Red, Green and Blue, each pixel can have a wide range of colors
- Play with the color selector in a word-processor
- In this example, each color is represented by a number from 0-255

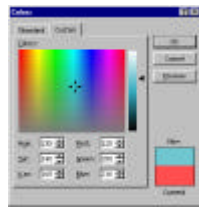


Image Compression

- When files are sent across the network, file size is important
- Because images have a lot of repetitive, redundant or unnecessary information, they can be compressed using several techniques

Image File Formats

- There are a number of popular image formats
 - TIF - Tagged Image File Format
 - JPG - Joint Photographic Experts Group
 - GIF - Graphics Interchange Format
 - BMP - Bit MaP - Windows format

Tagged Image File Format

- This is generally a raw, uncompressed format
- 24 bits of data are used for each pixel
- Each pixel is stored separately
- A full screen image (640x480) would be 1 Megabyte - It would fill a floppy disk and take several minutes to download over a modem
- Often produced by scanners

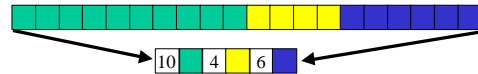
Joint Picture Experts Group

- JPG (or JPEG) is designed to compress photographic material
- Photographs often have many colors which are very similar
- JPEG can highly compress an image by discarding detail which is "not visible"
- Can introduce "artifacts" in high-contrast material



Graphics Interchange Format

- Developed (and patented) by CompuServe/Unisys
- Designed for computer graphics
- 256 Distinct Colors
- Compression uses "Run-Length-Encoding"



GIF Features to Explore

- Transparency
 - Pick a color in your image to render as transparent
 - E.g. the wall behind a human subject
 - The picture will blend into the Web page
- Animation
 - This is how banner ads work
 - Very easy to set up
- Many image editors can handle transparency and animation

Up Next: Getting Images

Continue

Getting Images

- From the web or from a library
 - Right click trick
- Create them in a draw program
- Input a digital image
 - Digital cameras
 - Scanners
 - Photo Floppies or Photo CD
 - Develop to the Web

A Word About Copyright

- Most content on the Web is copyrighted
- The copyright symbol © is *not* required
- It is generally *not* acceptable to republish text and images from Web sites -- nor from books, magazines, etc.
 - Even if your use is non-profit
- Civil and criminal penalties apply
- Get permission, or don't do it!

Note: This slide is Copyright 1998, 1999 Richard Wiggins, used with permission :)

Working With Images

- Get a good image editor
 - Paint Shop Pro (shareware)
 - Lview Pro (shareware)
 - Adobe Photoshop
 - Adobe Photodeluxe
 - A stripped-down version of Photoshop
 - With many user-friendly features and effects
 - Included with many scanners
 - Corel PhotoPaint

What Image Editors Can Do

- Convert among various formats
- Rotate images
- Resize or crop images
 - Standard video monitor is at least 640 X 480 pixels
- Adjust contrast, brightness, number of colors
- Add text, even combine images
- Apply a variety of special effects

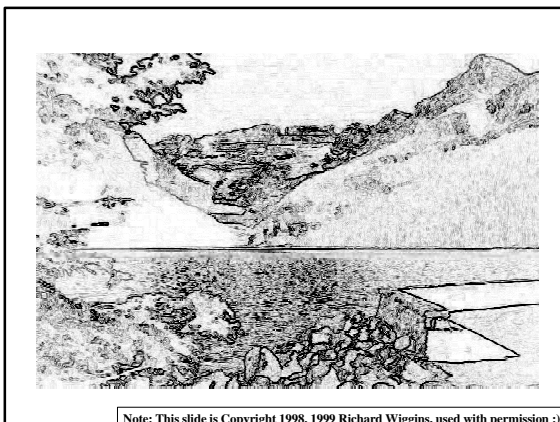
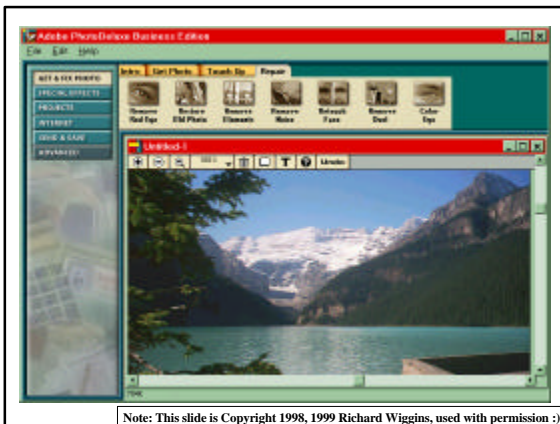


Image Size Matters

- Reduce your image to the minimum possible to convey your meaning
 - A 100 kilobyte image is too large!!!
 - Reduce size of image
 - Reduce number of colors in image
 - Use a GIF optimizer in image editor
- Use thumbnails instead of full-size images
 - Thumbnail is small, points to larger image

Up Next: Putting Images into Web Pages

Continue

The IMG Tag

- We use the IMG tag to include images into our web pages
- In this example, we use a *relative* link so the image must be in the same directory as the HTML file

```
Welcome to MSU Virtual
University
<P>

```



- You can use an image as an HREF in an anchor <A ...> tag
- You can use the image as the “clickable” element in an anchor TAG
- This can be used to show a “thumbnail” of an image in the main page

```
Click on the picture for a
larger image <p>
<a href="large.jpg">

</a>
```



More IMG tag Stuff

- *Border=0* removes the line around the image when it is in an anchor tag (i.e. Clickable)
- *Align=Left* or *Align=Right* allows the text to flow around the image

```
<a href=http://www.msu.edu/~crs/>
<img src=crs.gif align=right
border=0>
</a>
You can contact the instructor on-
line using .....
```

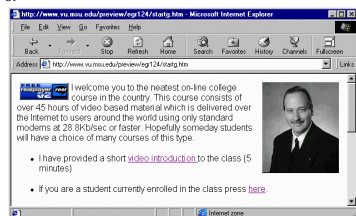


```
<a href="http://www.real.com/">

</a>
<a href="http://www.egr.msu.edu/~crs/">

</a>
<p>
```

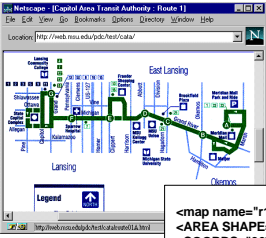
I welcome you to the neatest on-line college course in the country. ...



More Options on IMG

- HEIGHT and WIDTH
 - Speed the display of the page
 - Can stretch or shrink the image for display if they do not match the actual height and width of image
- USEMAP
 - Specifies the client side image-map to be used to create clickable areas within an image
- ALT
 - text to be displayed if images are not loaded or while an image is loading

Image Map Example



```
<map name="r1">
<AREA SHAPE="RECT"
COORDS="367,90 432,134" HREF="route01A.html">
<AREA SHAPE="RECT"
COORDS="327,113 366,175" HREF="route01B.html">
<AREA SHAPE="RECT"
COORDS="273,96 305,146" HREF="route01C.html">
...
</map>
```

Summary

- Images are what makes the "World-Wide-Web go around"
- Working with images can be a lot of fun
- It is pretty easy to get started
- You can develop skills to a point where you work with digital images and software for a living as a graphic artist